University of Santa Clara Bulletin

UNDERGRADUATE COURSES & DEGREES

1974-1975

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UNIVERSITY OF SANTA CLARA

UNDERGRADUATE COURSES AND DEGREES 1973-74

UNDERGRADUATE CATALOG

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General Information

UNIVERSITY ACCREDITATIONS AND MEMBERSHIPS

One Hundred and Twenty-third Year

1973-1974

Accredited by the Western Association of Schools and Colleges
Accredited by Engineering Council for Professional Development
Accredited by the American Chemical Society
Accredited by the State Bar of California
Accredited by the American Association of Collegiate Schools of Business (Undergraduate and Graduate Programs)
Accredited by California State Board of Education
Approved by the American Bar Association
Approved by the American Medical Association
Member of American Council on Education
Member Council of Graduate Schools in the United States
Member of Association of American Law Schools
Member of Association of Jesuit Colleges and Universities
Member of Conference of Jesuit Law Schools
Member Conference of Western Law Schools
Member of College Entrance Examination Board
Member of Association of American Colleges
Member of American College Public Relations Association
Member of American Alumni Council
Institutional Member of the American Mathematical Society
Academic Member of the Mathematical Association of America

THE UNIVERSITY OF SANTA CLARA

Santa Clara, California 95053

UNDERGRADUATE CALENDAR 1973-74*

Fall Quarter

September 3	Monday	Labor Day, administrative holiday.
September 18	Tuesday	Freshman registration, p.m.
September 19	Wednesday	General registration (sophomores, juniors, and seniors).
September 20	Thursday	Instruction begins.
September 26	Wednesday	Last day for late registration and the adding of courses.
October 15	Monday	Last day for seniors to file for candidacy for graduation 1974.
October 30	Tuesday	Undergraduate deficiency grades announced.
November 22-23	Thursday-Friday	Thanksgiving recess, academic and administrative holidays.
November 21	Wednesday	Last day to withdraw from courses.
December 3-7	Monday-Friday	Fall quarter examinations.
December 10-January 1	Monday-Tuesday	Christmas recess.
December 11	Tuesday	Fall quarter grades due at 9:00 a.m.
December 24-25	Monday-Tuesday	Christmas administrative holidays.
December 31-January 1	Monday-Tuesday	New Year's administrative holidays.

Winter Quarter

January 2	Wednesday	Undergraduate registration.
January 3	Thursday	Instruction begins.
January 9	Wednesday	Last day for late registration and adding of courses.
January 14	Monday	Martin Luther King's birthday, academic and administrative holiday.
February 14	Thursday	Deficiency grades announced.
February 18	Monday	Washington's birthday, academic and administrative holiday.
March 6	Wednesday	Last day to withdraw from courses.
March 13-16	Wednesday-Saturday	Winter quarter examinations.
March 18-23	Monday-Saturday	Spring recess.
March 20	Wednesday	Winter quarter grades due.

* All dates are inclusive dates.

Spring Quarter

March 25	Monday	Registration.
March 26	Tuesday	Instruction begins.
April 1	Monday	Last day for late registration and adding of courses.
April 12-15	Friday-Monday	Easter recess, academic and administrative holidays.
April 24	Wednesday	Last day to file pre-registration forms.
May 1	Wednesday	Deficiency grades announced.
May 27	Monday	Last day to withdraw from courses.
June 3	Monday	Senior grades due at noon.
June 4-7	Tuesday-Friday	Spring quarter examinations.
June 8	Saturday	123rd Commencement.
June 11	Tuesday	Spring quarter grades due.

Summer Session

June 17	Monday	Summer Session begins.

1973

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HISTORICAL PERSPECTIVE

On January 12, 1777, six months after the signing of the Declaration of Independence, a cross was planted at a site in the present city of Santa Clara by a Franciscan Padre, Tomas de la Pena, to mark the founding of the eighth of California's original twenty-one missions, Santa Clara de Assis.

Three quarters of a century elapsed before the University of Santa Clara or Santa Clara College as it was first known, opened its doors as an institution of higher learning. In the intervening years, however, the Mission served as a spiritual center and school for the Indians. Besides religious instruction, the men were taught stockraising, farming and the building trades; the girls, weaving and sewing; the boys, reading, music and religious drama. From 1777 until Mexican government secularization, February 27, 1837, some nine thousand persons were baptized at the Mission. More than eight thousand of these were young or adult Indians.

During the early period, the less solidly built Mission buildings of the first and second sites were destroyed by the flooding waters of the Rio Guadalupe. The third Mission church, of adobe, was completed in 1784 but was seriously damaged by earthquake in 1812 and 1818. A fourth church, likewise of adobe, was used temporarily from 1819 to 1825. The larger fifth Mission with its quadrangle patio, also of adobe, was completed and dedicated August 12, 1825. The University's Adobe Lodge Faculty Club formed the west wing of the quadrangle.

The first site of Mission Santa Clara is marked by a California State historical landmark, located near the intersection of Kifer Road and De la Cruz Boulevard. Crosses mark the second site at De la Cruz Boulevard and Martin Street, and the third site at Campbell and Franklin Streets. The fourth Mission Church stood in the area between Kenna and Delia Walsh Administration building on the University campus of today.

During the first three decades of the nineteenth century, the old Mission enjoyed its most fruitful years. In 1827, well over fourteen hundred Indians lived within sound of the Mission's bells. In that year, some 15,500 sheep, 14,500 head of cattle and abundant crops of wheat, corn and beans were produced and cared for by the Indians under the Padre's guidance.

A combination of factors terminated the decades of prosperity at Santa Clara and the other California Missions. The Mexican War of Independence brought turmoil from 1810 to 1821 with resultant decrease of Franciscan personnel and donations in aid from benefactors. The new Mexican government took possession of the old Jesuit Pious Fund of the Californias that had been the main source of support for the Mission. Most of the Indian's lands, cattle and sheep became the object of spoliation by unscrupulous civil administrators.

In 1827 and again in 1829 governmental decrees ordered exile for all Spaniards who refused allegiance to the new regime. Since most of the Mission Padres were from Spain, many chose banishment. Some, however, remained until, in 1833, Mexican Franciscan replacements arrived from the missionary college of Zacatecas. Among them was Fray Francisco Garcia Diego y Moreno who was to become the first bishop of the Californias. Although thoroughly committed to the welfare of the Indians, the Padres' resistance to governmental encroachment upon the Indians' rights and property had little effect. Finally came full secularization of Mission properties, imposed at Mission Santa Clara in early 1837. This ended the effectiveness of the Franciscan missionary endeavor in Alta California. Within a few years, the Mission buildings and the Indian lands, cattle and sheep fell to the possession of the civil officials and their friends.

In the early 1840's a new people and a new way of life came to Alta California. Most of the immigrants were Anglo-Americans, attracted by the rich lands of the Santa Clara Valley. In 1848, the Treaty of Guadalupe Hidalgo ceded California to the United States. Statehood was granted in 1850.

It was in this setting that Santa Clara opened its classroom doors in May of 1851. The new Dominican bishop of San Francisco, Joseph Sadoc Alemany, had asked the Jesuit Father John Nobili, formerly of the Oregon Missions, to open a college at the Mission of Santa Clara. During the first academic year, 1851-52, Father Nobili and a faculty of three other Jesuit priests and four competent lay professors gave instruction to twenty-six students in arts, sciences, music and drama. By 1858, new scientific apparatus arrived from Paris and integrated courses in science as well as in the classics and in commerce were offered.

April 28, 1855, Santa Clara College received its charter from the State of California. Slow but steady growth followed and distinguished graduates became prominent members of California life. However it was not until the Schools of Law and Engineering were founded in 1912 and the courses in the Humanities and the Sciences were expanded that the College became the University of Santa Clara.

Meeting the demands of urban growth in the Santa Clara Valley, the courses in commerce and finance were likewise amplified in 1926, and the University's School of Business Administration began.

In the same year, however, the old Mission Church was destroyed by fire. The present structure, an enlarged replica of the original, was completed in 1928 and consecrated by Archbishop John J. Mitty of San Francisco, October 9, 1936. It is roofed with the original mission tiles and contains many statues and paintings brought by the early Padres from old Mexico. Likewise, most of the interior decorations of the church, especially the sanctuary ceiling, is a careful reproduction of that of the original Mission.

From the 1930's through World War II, the University's enrollment was relatively stable. With the return of many war veterans, came an enlarged student body, new

resources and an expanded curriculum that led Santa Clara into a new era of rapid growth and development.

From the post-war period to the present, the face of the campus has been changing and expanding. Thanks to the generous support of many friends, eighteen buildings have been added and, today, four new facilities—the Bannan Classroom Building, the Heafey Law Library addition, the Louis B. Mayer Theatre, and the Student Activities Center—are in various stages of planning and construction.

In 1961 the University announced a major change in policy and accepted women students for the first time in its 110 year history and quickly became fully coeducational.

Although the student body has grown rapidly in the past decade, it has been held at a relatively small size—3100 undergraduates and 2900 graduate and law students.

Since 1960 the number of courses taught has more than doubled and there has been a proliferation of opportunities for individual study and research, including off-campus work/study programs.

In 1964 the University adopted an academic plan and calendar which divides the school year into three eleven-week terms and limits the number of courses a student may take to three or four in each quarter period.

As a independent, tuition and gift supported university, Santa Clara has been able to accomplish change in ways that reflect its traditional concern for the individual student.

Today, the University of Santa Clara, the first institution to offer classes in higher learning on the West Coast, continues its Mission heritage of service by assisting its students to equip themselves with the best of humanistic values and knowledge. Academic excellence in a well-balanced human being is the University's goal.

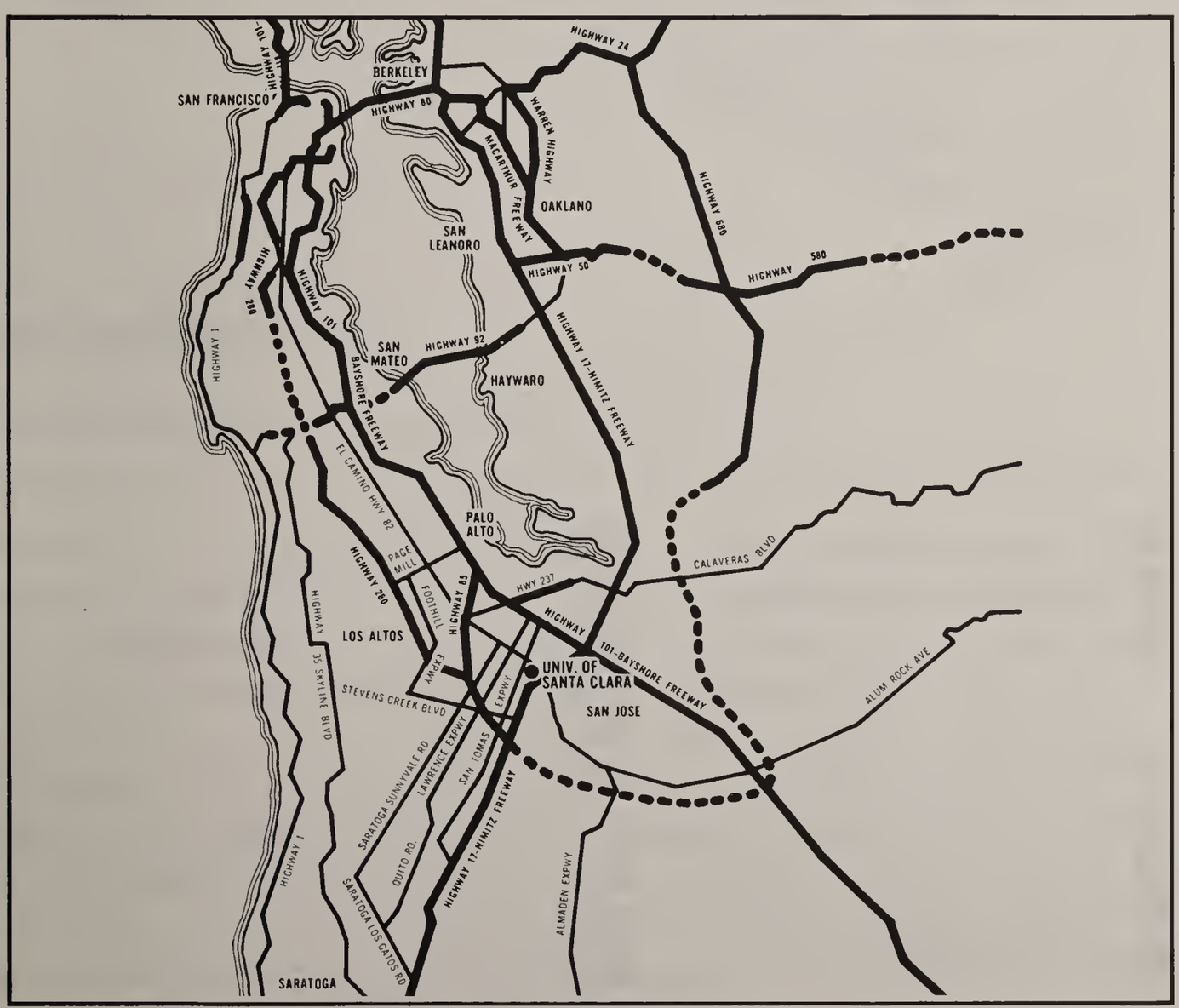
LOCATION

The University of Santa Clara is 46 miles from San Francisco near the southern tip of the Bay in an area that is rich in opportunities for learning. The campus is situated in the midst of one of the nation's great concentrations of high-technology industry and of professional and scientific activity. Many nearby firms and social agencies are world leaders in the search for solutions to man's most critical problems. The cultural and entertainment centers of San Francisco, Berkeley, Oakland and Marin County are within one hour's travel by bus, train or car. In the opposite direction, about thirty minutes away, are the beaches of Santa Cruz on the Pacific Ocean, and less than two-hours drive from the campus is world-famous Monterey Peninsula and Carmel.

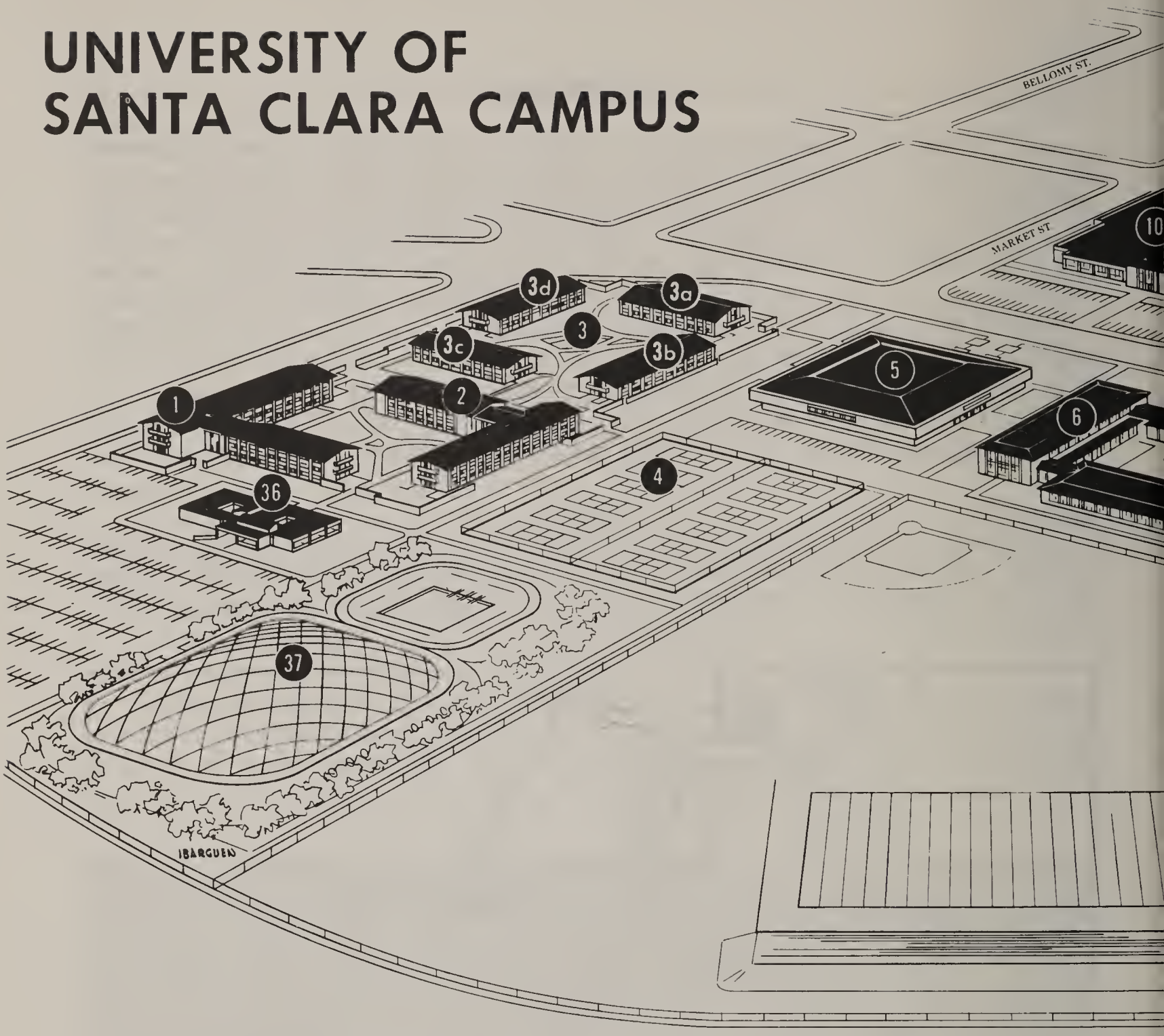
The University is accessible by major airlines via San Jose Municipal Airport just three miles away and via San Francisco and Oakland International Airports.

Climate

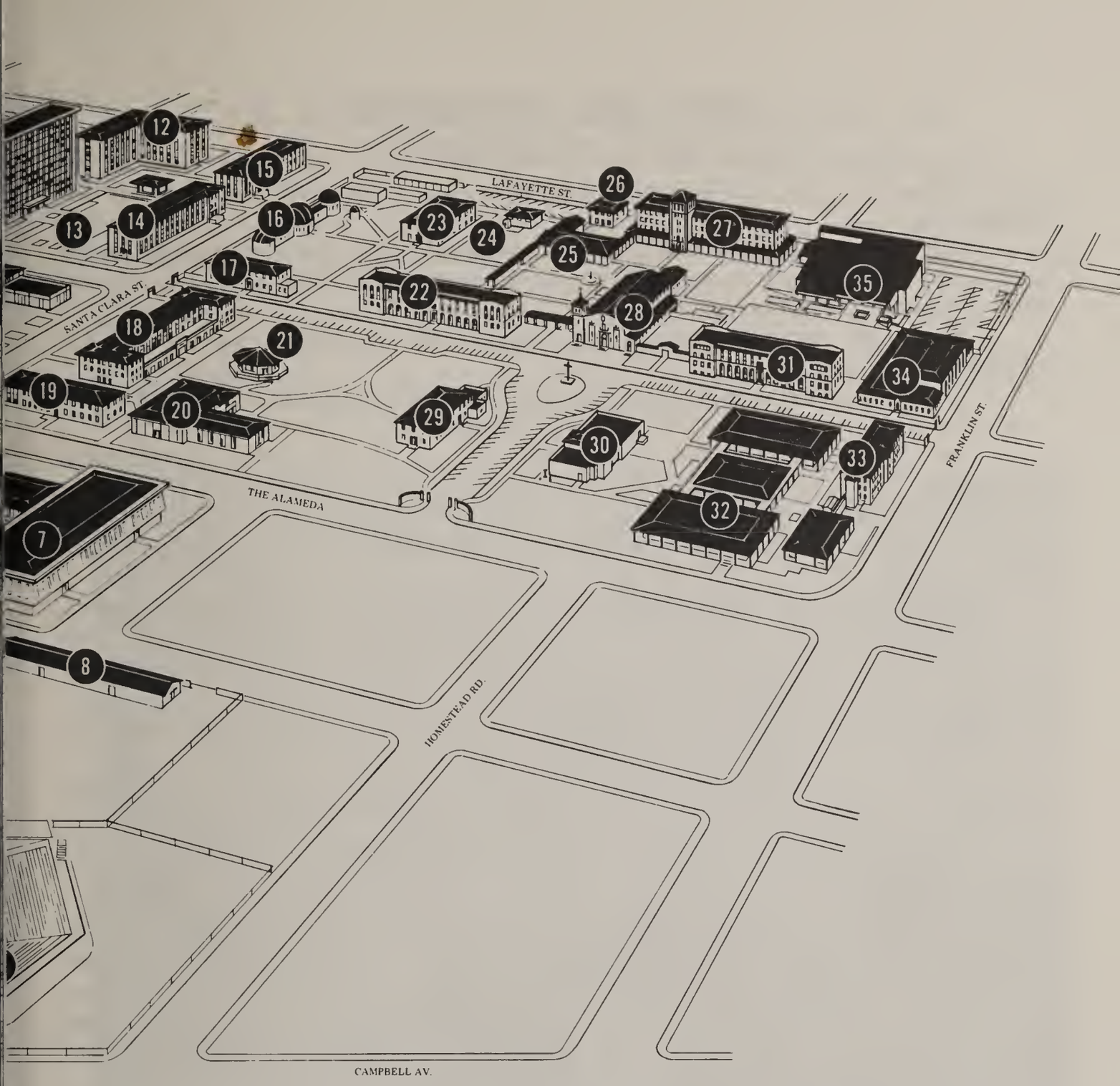
Santa Clara has a moderate Mediterranean climate. Over a period of 67 years the average maximum temperature was 71.4° and the average minimum 41.6°. The sun shines an average of 293 days a year and the average annual rainfall is about 15 inches.



UNIVERSITY OF SANTA CLARA CAMPUS



1. Sanfilippo Residence Hall
2. Campisi Residence Hall
3. Graham Residence Center
   - A Strub Hall
   - B Swig Hall
   - C O'Neill Hall
   - D Hancock Hall
4. Campus Tennis Courts
5. Michel Orradre Library
6. Sullivan Engineering Center
7. Bannan Classroom Building
8. Athletic Field House
9. Buck Shaw Stadium
10. Benson Memorial Center
11. Benjamin Swig Residence Hall
12. Dunne Residence Hall
13. John Kennedy Mall
14. McLaughlin Residence Hall
15. Walsh Residence Hall
16. Ricard Memorial Observatory
17. Donohoe Infirmary
18. Kenna Hall - School of Business



19 Bergin Hall - School of Law
20 Heafey Law Library
21 Publications Center
22 St. Joseph's Hall - Jesuit Residence
23 Varsi Hall
24 Restrooms
25 Adobe Lodge - Faculty Club
26 Service Building
27 Nobili Hall
28 Mission Santa Clara
29 Walsh Administration Building
30 De Saisset Art Gallery & Museum
31 O'Connor Hall
32 Daly Science Center
33 Alumni Science Hall
34 Seifert Gymnasium

Proposed Buildings

35 Mayer Theatre
36 Cowell Student Health Center
37 Student Activities Center

AIMS AND OBJECTIVES

The University of Santa Clara is an institution of higher learning founded by the Jesuit Fathers in 1851. The University is governed by a Board of Trustees of laymen and Jesuits.

Its principal objective is to provide superior undergraduate education in the liberal arts, in the sciences and in the professions of business and engineering to a student body of limited size and of high ability.

It also offers selected graduate programs in business, engineering, law and humanities and sciences.

It presents programs in theology, scripture, and other religious studies which include the major religious traditions but with emphasis on the Catholic tradition.

It encourages research as an important part of graduate and undergraduate education.

It encourages experimentation and innovation in teaching methods and curriculum to make the education more relevant to contemporary society and the needs of modern man.

It welcomes professors and students of all races, religions, and national origins.

It provides special assistance to disadvantaged students, not only to help solve social injustice, but also to diversify the student body in a way that will better prepare all the students to contribute to a pluralistic society.

Within this diversity it offers the opportunity for spiritual growth in private life and in the Christian community and worship which it fosters.

It is a scholarly community in which students, professors and administrators united in the search for truth, are actively involved in the formulation and implementation of institutional policy, and share responsibility for creating and maintaining an atmosphere in which all have freedom to learn, freedom to inquire and freedom to express themselves.

Santa Clara recognizes the importance of bringing to students, professors and the community at large, current and influential thought from the mainstream of contemporary life in philosophy, literature, science, the arts, politics, religion and other cultural areas through public discussion, seminars, conferences and exhibitions. These will not necessarily reflect the University position, nor agree with majority opinion, and they will not constitute an endorsement since they may represent divergent views.

Board of Trustees
University of Santa Clara
November 19, 1968

THE COLLEGE OF HUMANITIES AND THE COLLEGE OF SCIENCES

In these two colleges are presented the liberal arts or humanities and the natural, social and life sciences. The purpose of the colleges is to assist students in developing their powers of creative imagination, critical judgment and effective expression. They aim also at developing such skills, conceptual frameworks and technical competences as will serve the students in directing personal growth to the service of others.

Because of the broadly conceived objectives of the College of Humanities and the College of Sciences all undergraduate students in the University are required to take a certain portion of their programs in these two colleges.

School of Business and Administration

The School of Business and Administration correlates the general education aims of the University with preparation in meeting the general and specific problems of industry.

The specific aims are to supply professional training for those who are aiming at responsible positions in corporations, in their own businesses, in professional organizations serving business, or in state and federal government agencies; and to provide graduate work at both the master and doctoral levels.

The Schools of Business and Administration is divided into three divisions:

a) Undergraduate, leading to the B.S.C. degree.
b) Graduate, leading to the M.B.A. and Ph.D. degrees.
c) The Center for Leadership Development.

School of Engineering

" . . . it is a Catholic school, yet those of other faiths are admitted also, and their religious opinions are not interfered with . . . to cultivate the heart . . . a care of morals, no less than intellectual improvement, are duties kept sacredly in view . . . " John Nobili, S.J., first President of the University of Santa Clara.

To these goals of fundamental knowledge—an inquiring mind, good habits of self-discipline, aptly expressed by Santa Clara's first president—the professional school adds the requirement of preparation to make a specific social contribution. Engineering knowledge was once passed from generation to generation in the familiar pattern of the apprenticeship. With the increasingly complex applications of science which provided the groundwork for the Industrial Revolution, those who were charged with applying science to the needs of the society in which they live—engineers—turned to the universities for increased formal preparation in science and mathematics. To accelerate the rate at which knowledge of contemporary engineering applications could be learned above that of the apprenticeship, schools of engineering developed—extending the curriculum beyond science and mathematics to include the methodology of engineering applications. Not only were the traditional goals of the University embraced, but to them were added specific professional needs—needs not only of the individual, but of the profession he represents.

The function of engineering is to bridge science and society; to modify nature to meet the needs of society within the restrictions dictated by social, political, and economical considerations.

In order to act as the bridge between science and society, the engineer must be both knowledgeable in science and sensitive to the means which can be used to satisfy social needs.

The rapid expansion of knowledge and complexity in all areas of science and engineering suggests the need to both broaden the educational program and to increase specialization. Both goals cannot be accomplished in four years. Because of the wide variety of engineering opportunities, and because so many graduates determine to go on for further study, the School of Engineering undergraduate curriculum minimizes specialization and combines it with general study in the humanities and the social and natural sciences.

Students who desire an even more liberalized approach to engineering education may elect the Bachelor of Science in Engineering degree program which permits additional courses in the life sciences, business administration, or the social sciences.

One-third of those students who earn Engineering degrees undertake graduate work in engineering. An additional group pursues graduate work in law, medicine, business administration, city and regional planning, and other areas where an undergraduate preparation combining science, applied science, and the liberal arts is desired.

The engineering activity requires all types of people with different interests, preparations, and abilities. Regardless of the field of engineering, there is a pattern of assignments describing the kinds of jobs in which engineers engage. These include:

Technical Management in which the engineer directs a team of engineers—technicians, mechanics, and other skilled artisans.

Consulting in which the engineer alone, or as part of a firm, offers his services to a client needing professional counsel.

Design in which the engineer plans structures or systems, using his knowledge of scientific principles and the properties of materials.

Research and Development in which the engineer seeks additional knowledge about basic, physical phenomena and develops this knowledge into a product of service. In this assignment the engineer works closely with the scientist, and often their division of labor is difficult to identify.

Construction and Production in which the engineer translates the design engineer's drawings and specifications into structures, machines, or systems.

Teaching in engineering schools and colleges.

These are general assignments. Engineers also undertake assignments which require engineering background and experience, such as administration, management, and sales.

DIVISIONS OF THE UNIVERSITY AND CURRICULA

Santa Clara offers varied undergraduate and graduate curricula. In the undergraduate schools and colleges the programs are:

College of Humanities

Classics, Education, English, Fine Arts, French, German, History, Italian, Music, Philosophy, Religious Studies, Spanish, Speech, Theatre Arts, and General Humanities. Honors in most of the preceding areas.

College of Sciences

Biology, Chemistry, Economics, Mathematics, Physics, Political Science, Psychology, Sociology. Honors in several of these major fields.

School of Business

Accounting, Economics, Finance, Marketing, Management, and Quantitative Methods.

School of Engineering

Civil, Electrical and Mechanical Engineering and Applied Mathematics.

Graduate and professional programs are offered in the following schools:

Graduate School of Business

School of Engineering

Civil, Electrical and Mechanical Engineering and Applied Mathematics.

School of Law

College of Humanities

Education, English, History, Teacher Education.

MICHEL ORRADRE LIBRARY

In August, 1964, the holdings of the Varsi Library were transferred to the new and spacious Michel Orradre Library, named in honor of one of the principal donors, the Orradre family.

The new building, as completed to date, will hold 300,000 volumes and is designed to contain 600,000 volumes when further installations are made in the partially completed lower level.

The Library maintains an open shelf plan with special service areas grouped around the building's central core. The Library is an official depository for both California State and United States Governmental Documents.

The Library is open seven days a week for a total of 99 hours per week for the convenience and assistance of faculty, graduate and undergraduate students.

September, 1966, the holdings of the Michel Orradre Library in Biology, Chemistry and Physics were transferred to the new branch Science Library in the Edward Daly Science Center. Named after Mr. Frank Gentles, this collection will service the science departments in the immediate area for study and research.

STUDY ABROAD

Because of many cultural and academic advantages, the University of Santa Clara provides opportunities for study in Europe and Asia. Through its affiliation with the Institute of European Studies, junior students may study at Durham, Freiburg, Madrid, Nantes, Paris, or Vienna. In addition, the University is affiliated with the Rome program of Loyola University of Chicago and Gonzaga in Florence. Santa Clara also has a sophomore year program with Sophia University in Tokyo, and a junior year program with the Ateneo de Manila University in the Philippines. Santa Clara credit is given for work done at these centers. To enroll in any of these programs, the approval of the Director of Studies Abroad is required.

DIVISION OF CONTINUING EDUCATION AND EDUCATIONAL SERVICES

The Division of Continuing Education embraces those areas of academic endeavour not a part of the various Schools and Colleges of the University. This includes the six-week Summer Session and Extension Division. In addition, Educational Services includes the Audio-Visual department, T.V. services, and special event planning.

The Division is responsible for all University-sponsored seminars, workshops and conferences.

SUMMER SESSION

The University sponsors a six-week session each summer that offers both day and evening courses for college credit. Course work is available on both the undergraduate, and graduate level in both the normal six-week period and short-term workshops. No transcript is required for admission. Courses are scheduled in art, business (undergraduate), economics, education, English, history, language, mathematics, music, philosophy, political science, psychology, sociology, and religious studies. Graduate courses applicable to a master's degree are offered in education, English, history, languages, and mathematics.

Institutes and workshops of one, two and three weeks duration are presented in education, counseling, writing, political and social science, and religious studies.

Summer programs in the Far East and in Europe are also available.

Advanced placement for high school students permits high achievers who have finished the eleventh grade to enroll for university credit in freshman level courses and in intermediate languages. Recent graduates of high school are also eligible to enroll.

Board and room are available for men and women at reasonable rates in the University's attractive dormitories.

Evening courses in the Graduate School of Business and in the School of Law, as well as early-morning graduate courses in the School of Engineering, are separately administered. Information concerning these is obtainable from the individual schools.

EXTENSION DIVISION

Through the Extension Division, the University makes its facilities for continuing education available to the general community and to business and industrial concerns. Evening classes are offered in the arts and humanities, certificate programs are presented in business, data processing, engineering, and finance.

In addition to the evening program, the Extension Division sponsors numerous workshops and seminars in writing, engineering, and business topics. The Institute for Professional Growth is operated by the Division for the production of seminars and lecture series in a large variety of subjects for educators. The Institute for Continuing Engineering Studies produces workshops for practicing engineers.

Permanent records of the evening courses are kept in the Division's office and certificates are offered upon the completion of a set of courses in a given discipline.

CAREER EDUCATION CENTER

The Career Education Center of the University of Santa Clara provides activities and services that relate directly to career guidance and instruction.

In-service training workshops relating to career education are conducted for elementary and secondary school teachers, counselors, and administrators. Also, instructional career programs are offered on an individualized study contract basis to students who are training to be teachers and counselors. Career information resources are accumulated and maintained for undergraduate students to utilize in making career decisions.

In addition, The Career Education Center provides consulting services for school districts that are developing career education programs.

AUDIO-VISUAL

The audio-visual department is charged with providing the University community with all forms of audio-visual equipment and services. In addition to supplying projectors and audio tape equipment, the department also maintains photographic supplies and provides development of slides for presentation. Sound booths are available for listening and recording both mono and stereophonic records and tapes.

TELEVISION SERVICES

The television services provide for video viewing and recording of campus activities and academic courses. The University maintains three studios at the present time for controlled-production and does provide portable equipment for other areas on campus.

The University will broadcast live to the Bay area sometime in the near future. Cable transmission is expected to be available in the next two years.

WHERE TO WRITE

There is a central mail room on the campus to which all mail addressed to the University of Santa Clara, Santa Clara, California 95053, is delivered. It will expedite delivery on the campus to specify the following as indicated.

Correspondence relating to the general interest of the University:
Very Reverend Father President

Communications regarding curriculum, scholastic problems, degree problems:
The Dean of the particular school or the Academic Vice President

Admission Blanks and Entrance Requirements:
Director of Admissions

Alumni Affairs:
Executive Director, University of Santa Clara Alumni Association

Athletic Program:
Director of Athletics

Diplomas and Graduation:
Registrar

Extension and Summer Sessions:
Director of Continuing Education

Foreign Students:
Director of Admissions

Gifts, Grants and Bequests:*
Vice President for Development

Graduate Study:
The Dean of the particular school or college

Honors Program:
Director, Honors Program

Jesuit Community:
Very Reverend Father Rector

Personal Welfare and Health of Students:
Dean of Students

Placement:
Placement Office

Publicity:
News Director

Readmissions:
Registrar

Residence Accommodations and Student Housing:
Director of Housing

Scholarships:
Office of Financial Aids

Student Loans:
Office of Financial Aids

Teacher Certification and Placement:
Director of Teacher Education

Transcripts, Student Records:
Registrar

Tuition, Payment of Bills, Refunds:
Controller

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*THE UNIVERSITY'S LEGAL NAME is: *The President and Board of Trustees of Santa Clara College* to which should be added, a *Corporation, located at Santa Clara, California*. For the information of individual, corporation and foundation donors who wish the tax-benefits of their gifts and grants, the University is classified by the Internal Revenue Service as a 501(c)(3)(ii) tax-exempt organization and also as not a private foundation under Section 509(a) of the IRS code.

Student Life

Membership in groups and participation in extracurricular life are encouraged as such activity can be a valuable adjunct to the education of the Santa Clara man or woman. Although freshmen should limit their activities somewhat, they will readily find clubs whose purposes will correspond to their interests.

The Associated Students plan and administer an extensive social program which ranges from class- and group-sponsored picnics to more formal dances in prominent hotels in the San Francisco Bay Area. The University's proximity to San Francisco also allows it to bring the more famous personalities in the intellectual, cultural, and entertainment world to its campus.

Each sudent will find that the personal touch is very much a part of the Santa Clara tradition. Freshman Orientation is planned with the idea of familiarizing new students with the various phases of campus life. A large representation of upperclassmen will be on hand to meet with new students and to assist with the problems particular to incoming students. Special counseling and orientation plans for upper class transfer students take place prior to registration. The Fall Homecoming Weekend, scheduled for early November, is not only a highlight of the social calendar but also serves as an excellent way for students to become acquainted with each other and with the alumni.

The personal approach does not end with Orientation, nor is it restricted to student relationships. Faculty seminars in dormitory lounges and informal get-togethers provide a relaxing medium for discussion and enjoyment.

The University feels that an active cultural and social program is an essential part of the educative process. Accordingly, the Student Senate and various organizations, under the supervision of the Dean of Students, execute an extensive and varied activities program.

The major intercollegiate sports are football, baseball, and basketball; other sports are tennis, water polo, golf, soccer, swimming, and rugby. A full complement of intramural athletics are available for any student who wishes to participate.

The University maintains a program of instructional, intramural and intercollegiate activities for women. Tennis, swimming, volleyball, basketball, badminton, water-safety and many other sports are included, a number on a corecreational basis. Participation is open to all students according to interests and time limitations.

Although Santa Clara has grown rapidly in the last few years, it retains a friendly atmosphere and a personal relationship environment for which it is famous. This is a vital part of student life and an essential part of the University's particular kind of education.

STUDENT CONDUCT

The problem of conduct is a serious mandate on any University that accepts the responsibility for guiding students to maturity in an environment which respects human rights. Many students are away from home for the first time in their lives; others are finding new horizons opening to them as their educational experiences broaden.

The nature of the University demands that it operate in an academic atmosphere, in an intellectual and reasonable manner, and through orderly procedures—all in the pursuit of truth and wisdom. The preservation of rationality in the University is a neces-

sity if it is to survive. Thus, any act or conduct which infringes on the rights of others, which restrains freedom of movement and expression, which is contrary to the maintenance of good order, and which is disruptive of the University's operation, either in whole or in part, is unacceptable and a violation of the University's rule of good order. Actions or conduct violating any local, state, or federal law are per se a violation of the University's rules and regulations.

Students who participate in any act or conduct contrary to the University's rules and regulations shall be disciplined according to the Manual for the Administration of Student Discipline. Serious violations may lead to disqualification or a lesser sanction. Copies of this manual are obtainable on request from the Office of the Dean of Students.

The rules and regulations of the University are not solely restrictive; they serve as a means to an end and are designed to aid in the development of each student.

STUDENT HOUSING

The University maintains 12 dormitories for men and women. They provide as homelike an atmosphere as possible within the framework of the University's educational requirements. While the vast majority of these residences are coeducational, with men and women occupying different floors or separate wings of the same building, a few dorms are reserved for students who prefer to reside in an all-male or all-female setting. Three swimming pools are available. Upperclassmen are encouraged to select their roommates, so personal preferences may be served as much as possible. This privilege is not accorded freshmen.

Acceptance to the University as an undergraduate automatically includes acceptance in a residence hall. Undergraduate students who do not live with parents or other adult members of their families must live on campus. A Housing deposit has to be submitted as soon as acceptance notification has been received. Students who move off campus before receiving official approval, will be subject to room and board charges up to the time such approval is given.

Room assignments are made by the Director of Housing, but not until the housing deposit is received. (Single rooms are available on a limited basis.) Freshman will receive room assignments by mail no later than the month of August. Sophomores, juniors, and seniors may request a specific hall and/or roommate, if they wish. The applications are called "Room Reservation Request Forms" and must be completed along with the "Pre-registration Forms."

These forms will be distributed by the Housing Office to returning students the first of April. The returning students must submit forms to the Housing Office with their deposit. The deadline for returning these forms is on or before May 1st. Anyone who wishes a nonsmoker for a roommate should make this request to the Director of Housing on or before May 1st.

Rooms are provided with beds, mattresses, towel racks, bookcases, chairs, desks, chests of drawers, and medicine chests. A charge will be made for damage to rooms or furniture. Students must provide blankets, sheets, towels, pillows, pillowcases, washclothes, bedspreads, and desk lamps. Helpful extras could include a typewriter, an alarm clock, ash trays, a mending kit, and closet accessories.

Special service rooms are conveniently located in each building, with proper outlets for electric irons, heaters, sun lamps, hair dryers, and such appliances which are not permitted in the rooms. There is a linen rental, laundry and dry-cleaning service

available on campus for the convenience of the students. Television sets for student use are in various locations in the residence halls.

STUDENT GOVERNMENT

The system of student government at Santa Clara makes the students themselves responsible for the conduct of student affairs.

Students organize and supervise academic, cultural, and social activities through class government, clubs, and committees. In the Student Senate, the students establish the rules and regulations and sanctions governing student activity in the residence halls, at athletic and social events, and at extracurricular events on campus. Dorm Councils are an adjunct of student government. They share with the residence hall staff the responsibility of regulating student life in the halls as well as promoting academic, religious and social programs for resident students.

Law students have their own Student Bar Association as the instrument of student government in the School of Law. Therefore, law students are not represented in the Student Senate and are not subject to the jurisdiction of the Student Senate and the Student Court.

Student government at Santa Clara plays a vital role in the education of the students. As a genuine government of the students by the students, it develops responsibility and integrity in individual students.

Students also participate in university-wide governance through representation on the Community Council, the President's Council, and on University committees advisory to the president.

Associated Students

The Associated Students of the University of Santa Clara (ASUSC) is the student body organized for the conduct of student government. All fee-paying registered students are members.

The purposes of the ASUSC are to further the best interests of the University and its students, to encourage student activities, and to provide valuable experience and training in self-government and responsibility.

COUNSELING SERVICES

A variety of counseling services are conveniently available to all students. The University Chaplain and his assistant provide religious guidance in personal interviews and during the University retreats. The deans of the Colleges and Schools and the professors of the student's major department usually take care of the academic counseling of the students.

The University Counseling Center is complementary to, and supportive of, the total university counseling, guidance, and advisement effort. A professional staff of psychologists and guidance specialists is available to aid the students in dealing with academic, occupational planning, and personal-social problems which may confront them as maturing men and women. Counseling and testing procedures are used that are appropriate to the student's needs. The fundamental objective of these services is to enable the student to use his own resources in dealing with the problems he confronts.

GRADUATE FELLOWSHIPS OFFICE

The Graduate Fellowships Office assists Santa Clara seniors who plan to enter graduate study in the selection of schools and in securing financial aid, chiefly from private and public agencies which offer fellowships and other grants through national and international competition. For competitions in which candidates must be officially nominated or endorsed by the University, the Graduate Fellowships Office selects nominees and makes the endorsements. It maintains a collection of current catalogues on graduate study and financial aid, which are open to all students in the University, and it disseminates various kinds of special information pertaining to graduate study. It does not award fellowships, scholarships, or other financial aid for study at the University of Santa Clara. These matters are handled by the Office of Financial Aids and by the graduate admissions offices of the respective Colleges and Schools of the University.

PLACEMENT SERVICES

The Career Planning and Placement Center offers career assistance to alumni, graduates and seniors. Its chief aim is to expose them to career opportunities and provide a convenient meeting ground for prospective employers and candidates for employment.

In addition, it assists undergraduate students in career planning. There is a library with a wide range of literature on careers. There are brochures on all companies that visit the campus plus information on many others.

The Placement Center also assists students in securing part-time and summer employment.

The Placement Office is located in Room 208 Benson Student Union.

STUDENT HEALTH SERVICE

The Student Health Service is located in the Donohoe Infirmary on the campus and is under the supervision of the University Director of Medical Services.

All full-time undergraduate students and full-time law students are eligible for medical care under the folowing conditions:

1. The Student Health Service has a physician in attendance from 8 a.m. to 5 p.m., Monday through Friday while classes are in session. Visits to the Student Health Service during these hours should be made by calling the infirmary for an appointment. At all other times while the University is in session, medical care is available in cases of bona fide emergencies. The Student Health Service may be contacted through the infirmary or the University switchboard operator. With the exception of drugs, laboratory work and X-ray, no fee is charged to students utilizing the service.
2. Drug prescriptions may be filled at the University-designated pharmacy; the student will be billed for such prescriptions by the University. Prescriptions may, of course, be filled at any pharmacy, but in that case, it is the student's responsibility to make financial arrangements with the druggist of his choice for payment of the prescription.

3. X-rays, laboratory work, general hospital charges, consultations by physicians other than the University physicians and medical care rendered at a general hospital (with the exception of emergency room visits by one of the University physicians) will be charged to the student.
4. In-patient care is available to undergraduate resident students and day law students only, at no charge.
5. All students, of course, have the right to obtain medical care outside of the services offered by the Student Health Service, but in that case, the financial obligation for such care is the responsibility of that student.

All students are required to have a pre-entrance health examination by their personal physician. The results of such an examination are to be reported to the Student Health Service on the form designated by the University on or before the date of registration.

ATHLETICS

The University of Santa Clara maintains a well-balanced program of intercollegiate and intramural athletics for the benefit of the student body. All these activities are designed to supplement the traditional academic curriculum. Intercollegiate competition is conducted in football, basketball, baseball, tennis, water polo, golf, soccer, swimming and rugby against opponents of recognized national standing. The University is a member of the National Collegiate Athletic Association and the West Coast Athletic Conference.

A full program of intramural athletics in which all students are encouraged to participate is conducted under the direction of the Director of Intramural Sports.

Facilities for the athletic activities of the student body include the gymnasium with its basketball court, weight and wrestling rooms and swimming pool; centrally located tennis courts and extensive athletic fields for football, baseball, softball, soccer, rugby, track and field, and cross country.

The women's recreation department, serving some 1200 students, offers intercollegiate competition in basketball, volleyball, tennis, swimming and badminton and a varied instructional intramural program in swimming and water safety, first aid, tennis, golf, and flag football.

The women's recreational department also coordinates a co-rec (men-women) program in volleyball, softball, tennis, badminton, water safety and first aid.

Athletic Officers

Charles F. Guenther, S.J., M.A.	Chairman, Advisory Council
Patrick Carroll, S.J.	Faculty Moderator
William B. Perkins, S.J.	Faculty Representative
George P. Malley, B.S.	Director of Athletics and Football
Carroll Williams, M.S.	Basketball
Salvador F. Taormina	Baseball
Marygrace Colby, M.A.	Director of Women's Recreation
Patricia Moore, M.S.	Assistant Director of Women's Recreation

Staff Members

William McPherson, B.S.
John Pasco, J.D.
Andrew Locatelli, M.S.
Raymond Anderson, B.A.
William Wood, B.S.
David Chaplik, B.A.
Bob Phelps, B.S.
Michael Haake, B.A.
Jim Farwell, B.S.
Edwin Pugh
Henry Schmidt, B.S.
Richard W. Degnon, B.A.
S. M. Sanfilippo, J.D.
Kathryn B. Ivers
Robert Carter, M.A.
Pat Lovell, M.A.

RELIGIOUS ACTIVITIES

The group of priests and laity who comprise the Chaplain's Office serve as facilitators for a variety of opportunities through which members of the University Community are enabled to deepen their understanding and experience of themselves as humans and as Christians.

Central to the expression of Christian life on campus is the liturgy. Each weekend six Masses, celebrated with different styles of liturgy, are provided for the University Community. Five of these Masses are coordinated by groups of students working with the celebrant. Other Masses are provided during the weekdays and for specific groups as the need arises. In addition, marriages, baptisms, and communal celebrations of penance are provided for members of the University Community.

During the year, the Chaplain's Office sponsors a variety of weekend experiences for different segments of the University Community.

All members of the Chaplain's Office are engaged in varying degrees in providing counselling for members of the University Community.

The main religious organization on campus is the Christian Life Community, a 'community' of Christian men and women of Santa Clara who freely commit themselves to the service of God and mankind according to a specific spirituality based on the Spiritual Exercises of St. Ignatius of Loyola.

STUDENT ORGANIZATIONS

There are a number of national and departmental organizations on campus to which students may belong. These organizations generally fall into two categories: those that recognize achievement of individual students in their chosen academic fields and those special interest organizations which permit individual students an opportunity to meet with others having the same interests.

The University of Santa Clara does not recognize national social fraternities or sororities.

A complete listing of student organizations is given in the *Student Handbook,* available each year to all members of the student body.

GENERAL ACHIEVEMENT AWARDS

Nobili Medal: An annual prize of a gold medal founded by Joseph A. Donohoe, in honor of the first President of Santa Clara, the Rev. John Nobili, S.J., to be awarded to the male student who shall be judged outstanding in personal conduct, activities, and academic excellence.

Saint Clare Medal: An annual prize of a gold medal, established by the University of Santa Clara, to be awarded to the woman student judged outstanding in personal conduct, activities and academic excellence.

COLLEGE PRIZES

Business Administration Prize: An engraved key given by the Business Administration Association to the senior in the School of Business who shall have made the greatest contribution to the School of Business.

The Isabel Jones Prize: An annual prize donated in memory of Mrs. Isabel Jones by her husband, Dr. Eliot Jones, to be given to the senior student of the School of Business who is judged by the Faculty of that School to be outstanding in scholarship.

The Charles J. Dirksen Prize: An annual prize donated by Dr. Eliot Jones in honor of Dean Charles J. Dirksen to be given to the junior student in the School of Business who is judged by the Faculty of that School to be outstanding in scholarship.

The Orella Prize: An annual award established in 1915 by the late Dr. Firmin R. Orella, B.S. '89, and funded in 1945 by his wife, Albertine S. Orella, to be given to the senior student in the departments of science who attains the highest average in scientific subjects during the junior and senior years.

The Schwartz Prize: Two annual prizes, donated in 1955 by Dr. Sidney L. Schwartz of San Francisco, to be given to students submitting papers in Finance and Business or Economics which shall be judged outstanding by the Faculty of the School of Business.

Freshman Mathematics Prize: An annual award of books to a freshman student selected by the Mathematics Faculty for excellence in mathematical study and achievement during his freshman year.

The Putnam Mathematics Prize: awarded for the best achievement by a Santa Clara student in the annual Putnam Intercollegiate Competition.

DEPARTMENTAL PRIZES

Professor O. Robert Anderson Key: An engraved key in memory of Professor O. Robert Anderson to be given to the senior student in Accounting who is judged by the faculty of the Accounting Department of the School of Business to be outstanding in scholarship.

The Religious Studies Prize: A prize given by the President of the University, awarded annually to an upper-division student, for proficiency in religious studies selected on conditions set down by the Department of Religious Studies.

Santa Barbara Medals: Four gold medals, given by the President of the University, to be awarded annually, on the recommendation of the Professor of Military Science, to the outstanding cadet in each of the four years of training.

The Sourisseau Prize: An annual prize founded in 1955 by Miss Eva Sourisseau of San Jose, in honor of her parents and family, to be given to the senior student of the University who shall be selected by the Department of Philosophy for outstanding philosophical achievement.

The Michael Shallo Prize in Political Science: An annual prize founded in 1955 by the University, in honor of Father Michael Shallo, S.J., Professor of Political Philosophy, to be given to the student of the University selected by competition as the most proficient in political science.

The Finance Medal: Awarded to the senior majoring in finance with the highest scholastic average.

The Civic Club Italian Prizes: Three prizes contributed in 1949 and thereafter by the Civic Club of San Jose, to encourage the study of Italian language and culture, to be given to the students attaining the three successively highest grades in the study of Italian.

The Medal of the Association of the Army of the United States: Awarded to the outstanding cadet of the first year of the Advanced Curriculum of ROTC, for exceptionally meritorious academic attainments, exemplary conduct, efficiency, and fidelity.

Department of the Army Superior Cadet Ribbon Award: Four ribbons awarded annually by the Department of the Army to the outstanding cadet in each academic class of Senior Division ROTC program at the University who has consistently demonstrated potential qualities as an officer.

The Armed Forces Communications and Electronics Award: For academic achievement and meritorious contribution to the ROTC program by a senior cadet in a communications or electronics-related field.

The Ryland-Owl Prizes: The Hon. Caius T. Ryland founded in 1897 an annual purse leaving its disposition to the discretion of the Faculty. This the Faculty, after due consideration, assigned to the University Literary Congress, organized February 22, 1857, establishing the Ryland Debate to be held yearly between the two branches, the Senate and the House, and divided the purse into three prizes. The directors of the College Magazine, "The Owl," founded an annual prize to be given to the winner of an oratorical contest in the University. Since the oratorical contest is no longer held, the prize formerly awarded for the competition is now added to Ryland Debate prizes.

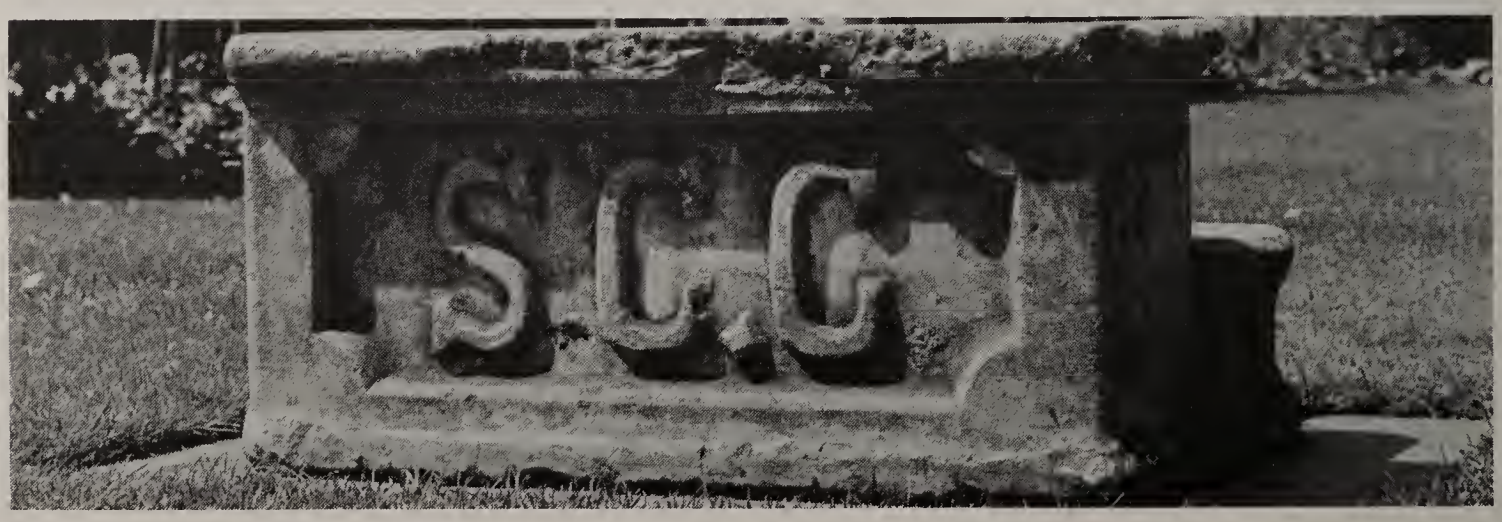
The William H. Leahy Prize: This prize was founded in honor of Mr. William Leahy by his wife and his brother, Mr. James Leahy, for proficiency in acting.

The Handlery Prize: An annual prize founded by Mrs. Rose Handlery, in memory of her son, Raymond, of the class of 1934, to be given to the senior student of the University who will have contributed most to the success of any of the University student publications.

The McCann Prize: Annual prize founded in honor of Daniel M. McCann, B.S., '84, to be given for the best short story.

The Redwood Prize: Annual prize founded in 1908 by the executive committee of "The Redwood," and given for the best essay on an historical subject.

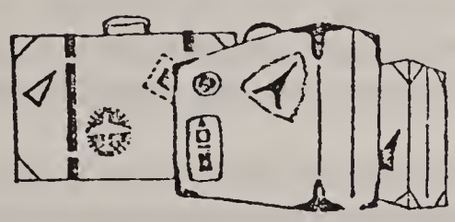
The Shipsey Poetry Prize: An annual prize founded in 1954 by Richard M. Schmidt, in honor of the late Reverend Edward Shipsey, S.J., to be presented to the student selected by the Faculty of the Department of English for the most outstanding contribution in the art of poetry.



Academic Information

CRITERIA FOR ADMISSION

The University makes selective and individual decisions on the applicants for admission. Freshmen applicants are offered admission, based on the following criteria (in order of importance): first, secondary school record; second, scores on College Entrance Examination Board tests; third, school recommendation; fourth, personal factors such as extracurricular involvement, character, leadership; fifth, relationship to the University. The offer of admission to high school seniors for freshman standing is contingent upon the applicant's graduation from an accredited high school. It should be unnecessary to state that the University welcomes students of all ethnic and religious backgrounds.



RECOMMENDED COURSES

The following high school courses are recommended for a student applying for admission to the University as a freshman:

	NUMBER OF UNITS		
Course	*Humanities Majors*	*Business & Social Science Majors*	*Natural Science, Mathematics and Engineering Majors*
Algebra	1	2	2
English	3	3	3
History	1	1	1
One foreign language	2	2	2
Plane geometry	1	1	1
Lab science (upper division)	1	1	2*
Trigonometry			½
Optional†	7	6	4½

*Physics and Chemistry are required lab science for Natural Science and Engineering Majors.

†Optional courses must be in advanced foreign languages, mathematics, laboratory science, or other solid college-preparatory courses.

ADMISSION PROCEDURE

The prospective freshman student should:

1. File his application and service fee of $20.00 with the Admissions Office, University of Santa Clara (application forms may be obtained from that office).
2. Submit a recommendation from his school, evaluating scholastic ability and character, to the Admissions Office (recommendation form is provided with application).
3. Request his high school to send a transcript of work, after 3½ years of high school (spring semester of the senior year) to the University of Santa Clara.
4. Take the Scholastic Aptitude Test of the College Entrance Examination Board in January of the senior year or earlier, and request that scores be sent to the University. For information on dates and places of this test write to the College Entrance Examination Board, Box 1025, Berkeley, California 94701, or Box 592, Princeton, New Jersey 08540.
   Note: In addition to the SAT, the English Composition Achievement Test is required of all students and students applying for Chemistry, Physics, Mathematics and Engineering must take achievement tests in Mathematics (Level I or II), and one of the following: Chemistry, Physics, Social Science. The achievement tests are used for placement and must be submitted prior to matriculation at the University.
5. Make certain all the above are completed, and the required materials are submitted to the Admissions Office by March 1. Full consideration cannot be assured for applications received after that date.

Sixth-Semester Decision

Students who have earned a 3.5 grade average (4.0 being straight A) in the first three years of high school work may seek an admissions decision after their sixth semester. Their application should be clearly identified. Transcripts reflecting six semesters of work and recommendation forms should be sent by the high school. The decision concerning admission will be rendered promptly. It is requested that early decision applicants submit College Board scores during the junior year or in the summer before the senior year. Students notified of acceptance after six semesters of high school work will not have to make the normal admission deposit until May 1 of their eighth semester, since it is assumed that a student applying under this special category will, if accepted, enter the University.

Advanced Placement

Advanced placement and College credit may be obtained through the College Board Advanced Placement Program. The student will be notified of the placement and credit the University will grant after scores are received.

Admission of Foreign Students

Candidates for admission who come from foreign countries must present a score in the Test of English as a Foreign Language, which is administered by the Educational Testing Service. Foreign students, both freshmen and advanced standing applicants, must also take the Scholastic Aptitude Test of the College Entrance Examination Board. In order to be issued Immigration Form I-20, applicant must be accepted as a full time student working toward a degree.

ADMISSION TO ADVANCED STANDING (TRANSFERS)

General University

The University accepts a number of transfer students, principally at the sophomore and junior levels, each year.

Since applications greatly exceed the number of such students who can be accommodated, and are increasing each year, no specific statement can be made about the quality of work (g.p.a.) which will enable a transfer applicant to be accepted. Only students in good standing at the last college attended will be considered. No student on academic or disciplinary probation, or suspension, will be considered for admission.

There is no minimum number of units required for transfer admission. An exception to this is the student who was not acceptable as a freshman. Such a student cannot be considered until he or she has completed at least 45 quarter units or 30 semester units of college work. In general, a student is classified by the number of units applicable to his degree program.

The Scholastic Aptitude Test of the College Entrance Examination Board is required of transfer applicants who have completed less than 45 quarter units or 30 semester units.

Transfer students may apply for admission for Fall, Winter and Spring quarters. Deadlines for applications to those terms are: Fall—July 1; Winter—Nov. 15; Spring—Feb. 15.

Transfer credit is fixed by the Deans of the College following the student's acceptance, and submission of registration deposit. No evaluation can be made before that time. The following general statements apply to transfer credit:

a. Courses from accredited four year institutions are generally acceptable if similar to courses listed in the *University of Santa Clara Bulletin*. Courses from accredited two year institutions are generally transferable under the same conditions, if (in California community colleges), they are designated as University transferable.
b. Courses of a technical or trade nature do not transfer.
c. Courses from non-accredited institutions, trade schools, extension or correspondence programs do not transfer.

School of Business and Administration

Students who transfer to the School of Business from other universities and junior colleges must complete, during their first two years of higher education a minimum of 60 semester or 90 quarter units in order to be given junior status. Included in these units must be six semester or nine quarter units of Principles of Accounting, six semester or nine quarter units of Principles of Economics, and six semester or nine quarter units of mathematics.

School of Engineering

Admission to advanced standing is by specific action of the Committee on Academic Standing, which will evaluate all credits presented and determine the rating of the candidate.

The student normally will be admitted to advanced standing if he has completed during his first two years, a minimum of 60 semester, or 90 quarter units. Included in the units must be 12 semester or 18 quarter hours of Analytical Geometry and Calculus, 6 semester or 9 quarter hours of Chemistry or Biology, and 10 semester or 15 quarter hours of Physics for Engineering and Science students.

Financial Information

STUDENT EXPENSES

1973-74

Application Fee ..... **$ 20.00**

This charge is to be sent with each application form and is not refundable.

Deposits:

All new students or students reapplying for admission **$100.00**

This amount is automatically credited to the student's account at registration or at the time of full-tuition payment. This deposit is not refundable.

All returning undergraduate students must make the deposits indicated below by *May 1st.*

A deposit of $100.00 is required for all returning *boarding students* .. **$100.00**

A deposit of $50.00 is required of all returning *day students* ..... **$ 50.00**

These deposits are not refundable after *June 30th.* Transfer from boarding to day student status after this date will result in forfeiture of $50.00 of the deposit.

Tuition per Quarter **$725.00**

Part-Time Tuition (see definition of part-time student below.) **1 term course** .. **$260.00**

2 term courses .. **$470.00**

Room and Board per Quarter* **$432.00**

Tuition, Room and Board are due and payable in full on the day of registration.

Fee for each change in scheduled course ..... **$ 2.00**

Fee for challenging a course (per course) ..... **$ 10.00**

Late Registration Fee ..... **$ 20.00**

Late submission of Form Fee (administrative forms, e.g. pre-registration, application for degrees, etc.—per day) ..... **$ 2.00**

Fee for Replacement of Identification Card ..... **$ 2.00**

Breakage deposit for Chemistry Courses with laboratory, depending on course ..... **$5.00-$20.00**

(Unused amount returned to student at close of course.)

Additional copies of student's transcript of grades (each copy of transcript) ... **$ 1.50**

Graduation Fee ..... **$ 25.00**

For Graduate Business, Engineering, Humanities, Law, and Summer Session, tuition and fees—see announcements of the various Graduate programs and Summer Session.

Charges for loss or damage in residence halls or to special equipment will be billed directly to the student and parents upon report of damage or loss.

Special Information: A full-time student who drops courses during the term will be considered full time for the balance of that term for tuition purposes.

Part-Time Students:

A Part-Time Student is defined as a Lower Division Student taking less than three (3) term courses, or an Upper-Division Student taking less than two (2) term courses.

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*Room and Board charges during winter and spring recess: By arrangement with the Director of Housing.

METHOD OF PAYMENT

Students should come prepared to pay all charges on the day of registration, or should have payments from home in the mail to reach the University at least TWO WEEKS prior to the date of registration.

Remittances should be made payable to the "University of Santa Clara" and mailed to the Business Office.

Students who have unpaid bills at the University or who defer payment without approval are subject to dismissal from the University and, as long as such payments remain unpaid, may not receive transcripts of credit nor any diploma.

For those who are not financially able to pay the full term charges in advance, there are several tuition plans administered by outside financing agencies which are available. Those who plan to avail themselves of one of these services should request information from the University at least three months prior to registration.

In addition, the University has several loan funds which are available to students and their parents.

REFUNDS

No refunds will be made by virtue of curtailment of services brought about as a result of strikes, acts of God, civil insurrection, riots or the threat thereof, or other causes beyond the control of the University.

REFUND OF TUITION: FULL-TIME STUDENTS

Students who withdraw from the University may receive refunds of tuition according to the following schedule:

For withdrawal prior to the first Monday after registration:
payment refunded *minus* $155.00

For withdrawal prior to the second Monday after registration:
payment refunded *minus* $210.00

For withdrawal prior to the fourth Monday after registration:
payment refunded *minus* $305.00

No further refunds of tuition will be allowed.

REFUND OF TUITION: PART-TIME STUDENTS

Students who withdraw from the University may receive refunds of tuition according to the following schedule, per course:

For withdrawal prior to the first Monday after registration:
payment refunded *minus* ..... $ 90.00

For withdrawal prior to the second Monday after registration:
payment refunded *minus* $105.00

For withdrawal prior to the fourth Monday after registration:
payment refunded *minus* $145.00

No further refunds of tuition will be allowed.

REFUND OF ROOM AND BOARD

Refund of unused board will be prorated from the Monday following the date of withdrawal.

No refund will be made of the payment for a room in the University's residence halls.

Refunds cannot be processed until one month after the student's withdrawal.

The above fees and charges are subject to change without notice.

FINANCIAL AID

To assist deserving students in continuing their education, the University of Santa Clara maintains a broadly-based financial aids program of scholarships, loans, grants and part-time employment. Administered by the Office of Financial Aids, these resources help bridge the gap between the cost of education and what parents and students can reasonably contribute.

The College Scholarship Service, of which the University of Santa Clara is a member, cooperates in this task by estimating the financial need of each student from information supplied on the Parents' Confidential Statement. On the basis of this recommendation and subject to the availability of funds, the Office of Financial Aids is then able to prepare a "package" of aids for which the student qualifies. This could include a scholarship, loan, grant or part-time employment under the work-study program or any combination of the four.

The cost of a college education today is expensive, but not prohibitive. A family, therefore, is expected to make a maximum effort to assist the student with college expenses. Financial help from the University and from other sources should be viewed only as supplementary to the efforts of the family.

The Office of Financial Aids maintains a staff of counselors who are most willing to talk with prospective students and their families regarding the financing of their education. These people will provide assistance to both parents and students in the burdensome and sometimes confusing process of financing a college education.

More complete information about the University of Santa Clara Financial Aids program is available in the *Financial Aids Bulletin*, published by the Office of Financial Aids.

Applying for Financial Aids

Incoming Freshmen

The different aids (scholarships, grants, loans, employment, etc.) vary in amounts and are renewable on a year to year basis provided the student fulfills the University's requirements and reapplies each year. The amount awarded in each type of assistance may vary from year to year depending upon the applicant's family financial circumstances. To qualify for financial aid consideration, a student must:

1. Secure a copy of the Parents' Confidential Statement (a questionnaire on finances) provided by the College Scholarship Service, have it completed and forwarded to the Service not later than January 15th preceding September enrollment, requesting a copy be sent to Santa Clara. No other forms are required at this time. If additional information is needed, the necessary forms will be sent to the applicant.
2. California residents must apply for a California State Scholarship if they intend to seek aid from the University. As such, California residents must arrange to to take the Scholastic Aptitude Test of the College Entrance Examination Board in either October or November. Aid from the University may be awarded even if an applicant is not awarded a California State Scholarship, provided the student applied for a State Scholarship.

All aid applicants will be notified of the disposition of their application if their Parents' Confidential Statement is submitted to the College Scholarship Service by January 15th. Notification will be made no later than April 15.

Present students must submit all necessary documentation in time to arrive at the Office of Financial Aids not later than February 15th. Detailed information may be

obtained by consulting the Financial Aids Policy Manual. Forms are available at the Office of Financial Aids.

Transfer students should forward a copy of the Parents' Confidential Statement to the College Scholarship Service by January 15th preceding September enrollment. In addition, transfer students must write to the Director of Financial Aids giving a brief history of their college experience and a detailed breakdown of any financial aid received at previous institutions of higher learning.

The University supports a limited grant program for disadvantaged students. Detailed information may be obtained by writing to the Special Assistants to the Dean of Students for either Mexican-American or Afro-American Affairs, University of Santa Clara, Santa Clara, Ca., 95053.

Aid Qualifications

In selecting students to receive financial aid, evidence of financial need is required. Once this criteria has been met, priority of consideration for the limited funds is given to applicants with the highest scholastic attainments. Students of exceptional academic merit should write to the Director of the Honors Program.

Scholarship recipients are expected to maintain an overall grade point average of 3.00. All other aid recipients must maintain a GPA of 2.00. All financial aid recipients must remain enrolled as full-time students for each quarter that aid is received and must make satisfactory progress towards a degree. Once enrolled and attending the University, aid recipients should consult the Financial Aids Policy Manual so that they may know exactly what is expected from them. Financial aid may be terminated at any time for serious infractions of the University's rules and regulations. As a general rule, graduate and professional students will receive consideration for financial aid after the undergraduate needs have been met. As a general rule, financial aid is not available for non-citizens unless they are in the United States on a permanent basis and have made application for citizenship.

Loans

Because scholarships and grants are limited, many students applying for aid find the most advantageous method of financing their education through a loan program. Among those available to students are the National Direct Student Loan program and Federally Insured Loans. Application forms and further information may be obtained from the Office of Financial Aids.

Deferred Payment Plans

Santa Clara provides a deferred payment plan which is administered through outside agencies. One-, two-, three-, and four-year contracts are available.

Jobs

Employment during the school year is not encouraged, and students will not be permitted employment which intrudes on their required study hours; however, Santa Clara realizes that it is necessary in some cases for students to hold part-time jobs. The University maintains a Placement Bureau on campus to assist students in securing part-time work.

Students who receive financial aid are expected to work during summer vacation. From their summer earnings men are expected to contribute at least $500, women $400, to meeting their costs at Santa Clara.

STORAGE OF PERSONAL PROPERTY

The University of Santa Clara is not responsible for students' personal property located in dormitory rooms or storage areas on campus.

Loss from fire, dishonesty, destruction, or disappearance is strictly a personal matter. It is the individual's responsibility to secure his or her own insurance coverage.

Academic Regulations

COURSE REQUIREMENTS

The undergraduate program is scheduled on a basis of three eleven-week terms per academic year of nine months. The eleventh week will be devoted to examinations. During the freshman and sophomore years the student schedules three or four courses per term and during his junior and senior years, he schedules three courses per term.

Classes are normally scheduled on Monday, Tuesday, Thursday, and Friday. The Santa Clara plan of academic performance envisions considerable independent study by the students. Wednesday will normally be kept free of laboratories, examinations, and seminars, to provide uninterrupted study periods.

Lower-division courses (numbered 1-99) are counted as four (4) quarter-units each, and upper-division courses (numbered 100-199) as five (5) quarter-units each.

A freshman or sophomore may not carry less than twelve (12) quarter-units per term without the written approval of his Dean, nor may a junior or senior carry less than ten (10) quarter-units per term without the written approval of his Dean.

No student may carry more than seventeen (17) quarter-units per term unless he has a 3.3 grade-point average and has written authorization to do so from the Dean. The only exception to this regulation is for juniors or seniors who, with written authorization from the Dean, take a fourth course for enrichment purposes. Such a course is graded on a special passed/not-passed basis (recorded as + or —) and does not fulfill graduation requirements.

Any student who registers for more than seventeen (17) quarter-units without written authorization from the Dean will not receive credit for the additional course(s).

A junior or senior who has declared a major may take on a passed/not-passed basis (recorded as P or NP) those courses certified by his departmental chairman to be outside his major. This option must be elected at registration and may not be changed after the close of late registration. Such courses, if passed, will fulfill graduation requirements. (P is equivalent to A, B, C+ or C; NP is equivalent to D or F.) They are not used in calculating the student's grade-point average.

A sophomore may take an upper-division course if approved by his Dean and provided his program does not exceed seventeen (17) quarter-units.

STUDENT CLASSIFICATION

Students are classified by the number of quarter-units successfully completed (recorded as A, B, C+, C, D, or P).

Freshman	0-44 quarter- units	Junior	89-127
Sophomore	45-88	Senior	128-

(A student who completes his third year with only 127 quarter-units will require more than three (3) terms to satisfy the graduation requirement of 175 quarter-units.)

A part-time student is defined as a freshman or sophomore registered for less than twelve (12) quarter-units, or a junior or senior registered for less than ten (10) quarter-units. A limited number of undergraduate degree programs are open to part-time students. Admission to these programs is by special action of the school or college Committee on Academic Status. Part-time students are not eligible for financial aid.

GRADING SYSTEM

A student's grade of scholarship is given according to the following marks:

A	Excellent	F	Failure
B	Good	I	Incomplete
C+	Above Average	W	Withdrawal
C	Satisfactory	P (or +)	Passed
D	Inferior	NP (or —)	Not Passed

A student must earn a C average in all graded work undertaken and, in addition a C average in the courses of his major in order to qualify for the Bachelor's degree. To determine a numerical average, 4 grade points per quarter-unit are assigned for each A, 3 for a B, 2.5 for a C+, 2 for a C, 1 for a D, and 0 for an F. To arrive at the grade-point average, the total earned grade points are divided by the number of quarter-units which have been undertaken. A C average is 2.0.

REPETITION OF COURSES

A student may, with permission, repeat a course in which a grade of D or F was received on the first attempt. He should use the letter R in registering for the course again. All grades, whether repeated or not, will be used in computing the student's performance.

WITHDRAWING FROM COURSES

Students may withdraw from courses without penalty up to one week before the beginning of final examinations. Dropping a course without a formal withdrawal will result in a grade of F.

ENTERING NEW COURSES

Students may enter a course for the first time only during the first week of classes of the term.

TRANSFER CREDIT

Courses taken at other institutions after a student has enrolled at Santa Clara will not be considered for transfer credit unless approved in advance by the appropriate academic Dean at Santa Clara. This also applies to courses taken while on leave from Santa Clara.

Students who transfer a specific course to the University from another institution will not accumulate credit for these courses unless they are accumulated in sufficient quantity to total the quarter unit equivalent of a term course.

The student's grade-point average is computed only on work done at Santa Clara. Collegiate work at another institution with a grade of C or better may be transferred to Santa Clara and counted in fulfillment of graduation requirements, but it will not be counted in determining the student's grade-point average and rank in class. The transfer value of pass-fail courses at another institution will be determined individually in each case. A student attending Summer Session should not expect to receive more than ten quarter units credit for work taken during a regular Summer Session either on this campus or at some other institution.

INCOMPLETES

A student's work may be reported incomplete if, due to unavoidable circumstances, some essential portion of his work in the course remains unfinished after the final examination. An Incomplete (I) becomes a Failure (F) unless the unfinished work is completed to the satisfaction of the instructor and proper notice filed with the Registrar within four weeks from the beginning of the next scheduled term, not including the summer session. Exceptions may be made by the Academic Vice President, in individual cases, on the recommendation of the appropriate academic dean. These exceptions must be approved by the Academic Vice President prior to the end of the four-week period just noted.

ACADEMIC PROBATION, DISQUALIFICATION, REINSTATEMENT

Probation and Disqualification

Students whose academic performance does not meet specified norms, in terms either of units completed or of grades achieved, will be placed on probation or disqualified from further attendance at the University. These norms are:

	Probation			*Disqualification*		
	*Quarter Units Completed**		*Grade Points Below C*	*Quarter Units Completed**		*Grade Points Below C*
By end of 3rd term	Less than 36 q.u.	OR	Down 7-15 g.p.	Less than 28 q.u.	OR	Down 16 g.p.
By end of 6th term	Less than 76 q.u.	OR	Down 7-15 g.p.	Less than 64 q.u.	OR	Down 16 g.p.
By end of 9th term	Less than 113 q.u.	OR	Down 7-12 g.p.	Less than 100 q.u.	OR	Down 13 g.p.
By end of 12th term	Less than 160 q.u.	OR	Down 5-12 g.p.	Less than 150 q.u.	OR	Down 13 g.p.

*Not counting courses with grades of: F, NP, I, W, +, —
Part-time students are not subject to these norms.

Reinstatement

A disqualified student may request readmission to the University, but reinstatement is rarely granted and then only by special action of the Dean and the Committee on Academic Status.

Requests for reinstatement should be addressed to the Admissions Office and should be accompanied by a full account of the student's activities during the period of disqualification which the student judges to warrant reinstatement.

WRITTEN EXAMINATIONS

Written examinations are held at the middle and end of each term. A report of the student's progress is prepared by the Registrar's office and mailed to his home only at the end of the term. A letter grade is posted by instructors at mid-term for each

freshman, but grades for other students are posted only in case of deficiency (grade of D or F or NP).

A student guilty of dishonesty in an examination will be given a failure for the course. In special cases, the administration may impose the penalty of dismissal from the University.

LEAVE OF ABSENCE

Undergraduate students who do not register for one term must reapply for admission if they wish to register again at a later time unless, prior to their absence, they received a written notice of leave of absence from the appropriate academic Dean. A leave of absence will be granted only for a specified time and normally not beyond one year.

Students who wish to return to the University before the end of their leave must reapply for admission in the usual way through the Admissions Office.

WITHDRAWAL FROM THE UNIVERSITY

When a student withdraws from the University, he must report to the Registrar for a Withdrawal Form and complete the necessary procedure under penalty of receiving Fs for all incompleted courses.

CHALLENGING COURSES

A course is said to be challenged when a student takes a special examination in the course for the purpose of obtaining credit for it. He may prepare for this procedure by directed independent study.

Any course in the catalog may be challenged except those specifically identified in the catalog as exempted from challenge (indicated by the letters NCX) and those requiring laboratories, studio, or specialized group work.

To challenge a course, a student must have a 2.2 cumulative average and a 2.5 average in his major field. Freshmen and transfer students are not eligible to challenge a course until they have completed one term of work at Santa Clara. A student desiring to challenge a course should obtain a form from the Office of the Registrar on which he will identify the course as well as any course he has previously audited or challenged. He must then receive approval from an instructor in the department and the Dean of his School. A fee of $10.00 will be charged for each course challenged. Only one course may be challenged per term.

Normally the examinations for challenging courses will be given on the third Saturday of each term. The petition for challenging a course must be submitted at least two weeks before the examination date.

Grades will be issued for challenged courses in the same manner as those obtained through regular graded course work. Pass-fail challenges are not permitted. Courses successfully challenged will fulfill graduation requirements but will not count towards the forty required for graduation. Challenged courses may not be used in the performance of residence requirements. The department shall establish the level of performance to be obtained and any requirements in addition to an examination which will be three to four hours in duration.

AUDITING COURSES

Students may audit one course in addition to the three courses they take in the upper division, or the four courses taken in lower division work. A student may not enroll as a course auditor and then decide to take the final examination for credit. If he wishes credit for an audited course, he may challenge the course during the following term through the normal challenging procedure.

Students who are not full-time students pay $125.00 per course for auditing. A student may not audit more than three courses during his four years at Santa Clara.

ATTENDANCE

Students are required to attend all classes. Penalties for absences are left to the discretion of individual instructors.

CHANGING COURSES, MAJORS, SCHOOL OR COLLEGE

Certain administrative procedures for changing course registration, changing majors within a College or School, or changing from one School to another must be observed or the student will be incorrectly charged, to the possible detriment of his academic record. The necessary forms and procedures may be obtained from the Office of the Registrar.

A SECOND BACHELOR'S DEGREE

Ordinarily work toward a second bachelor's degree is discouraged by the University but complete changes of objective occasionally require attainment of such an additional degree. Applicants for admission to undergraduate study for a second bachelor's degree must indicate by their previous scholastic record a strong probability of academic success in this undertaking. Admission is subject to approval of the Dean of the School or College in which work is to be done. A minimum of forty-five quarter-units beyond the first bachelor's degree is required. Financial aid is normally not available to students seeking a second bachelor's degree.

RIGHTS RESERVED

The curriculum and regulations affecting students may be revised at any time at the discretion of the University administration.

GRADUATION REQUIREMENTS

The general requirements for graduation from the University of Santa Clara can be summarized as follows:

1. Twenty-two courses in the first two years and eighteen (of which twelve are upper division) in the second two years, totalling at least 175 quarter-units, are the minimum course requirements for a bachelor's degree in all schools and colleges of the University. Courses in which an F or NP (or + or −) was received are not counted in these totals.

2. Achieve an overall academic performance level of a C which is a 2.0 numerical average.
3. Obtain a C average in the courses of the major.
4. Complete the residence requirement of at least thirty-five quarter units normally in the year immediately preceding the awarding of the Bachelor's degree. Transfer students who attend the university only in their senior year shall complete forty-five quarter units as a residence requirement.
5. In addition to requirements established by the separate colleges and schools of the University, each candidate for a bachelor's degree must complete a certain number of courses in Religious Studies. Students entering the University in the first year are required to complete three courses in Religious Studies, at least one of which must be completed after sophomore year (or during one of the two final years). Students entering the University in the second year must complete two courses, one of these during the final two years; those entering in third or fourth year, one course in either year.

College of Humanities

The College of Humanities requires that for a Bachelor of Arts degree the candidate complete forty term courses; eighteen of these must be taken in the final two years (junior and senior years) and at least twelve of them must be upper-division courses (numbered from 100 to 199).

In addition to the requirements of his major department, the student must pass the following core courses:

Two courses in natural science (biology, chemistry, physics, mathematics, history or philosophy of science, psychology as a natural science, engineering design, or physical anthropology);

Two courses in social science (anthropology, economics, geography, political science, psychology, or sociology);

Three courses in English (EN 1, 2, 3, or equivalents);

Three courses in a foreign language (or continuation of a foreign language studied in high school through course 22);

One course in music, fine art, or theatre art;

Four courses in the humanities, outside the major department, selected from the general areas of history, literature, and philosophy;

One course in the general area of ethnic studies (may be fulfilled simultaneously with any other requirement).

Major Department Requirements. Each department sets the requirements for its majors, but with the following stipulation: no department can require its majors to take more than a total of twelve courses, or less than eight courses in upper-division, in the department itself. With the approval of the Dean departments may establish additional requirements outside the major department.

College of Sciences

The College of Sciences requires that for a Bachelor of Science degree the candidate complete forty term courses; eighteen of these must be taken in the final (junior and senior years) and at least twelve of them must be upper-division courses (numbered between 100 and 199).

Candidates for the degree of Bachelor of Science must include in their programs, in addition to the requirements of their major departments, the following areas of study:

*English: Two courses in composition and literature.

Humanities: Four courses selected from any of the academic areas in the College of Humanities, but with no more than two courses in any one discipline.

Social Sciences: Two courses selected from the areas of Psychology, Anthropology, Sociology, Economics, Political Science and Geography.

Natural Sciences: One course in a natural science. The course chosen must have a laboratory associated with it.

Mathematics: Two courses.

Contemporary Issues: One course in the general area of Ethnic Studies.

School of Business and Administration

Lower Division. The recommended program for the first two years in the School of Business and Administration is the same for all students. Each person must complete at least 22 term courses (88 quarter units) in the lower division, including the following:

A. English. Three courses to be determined in accordance with the student's background. One of the three may be Speech.

B. History sequence. A total of three courses to be selected from the offerings of the History Department. Business and Society (73.011) and American Economic History (13.012) may be used in fulfilling the requirement.

C. Mathematics. A total of three courses, one of which may be a lab science. The following sequences are approved:

Quantitative Methods 14, 15, 16 (or Science);
Mathematics 1, Quantitative Methods 14, 15.

Most students in the School of Business will follow the sequence of Quantitative Methods 14, 15, and 16. However, the following sequences listed below will also satisfy depending upon the background of the students:

Mathematics 11, 12, 13 (or Science);
Mathematics 6, 7, Science;
Mathematics 1, 6, 7.

D. Accounting. Accounting 1, 2, 3.

E. Economics. Economics 1, 2.

F. Statistics. Quantitative Methods 40 or other approved statistics course.

G. Electives (5-7).

Upper Division. The primary objective in the upper division is to provide fundamental academic and professional training which will qualify graduates for the responsibilities of business. The secondary objective is to offer sufficient work in accounting, management, marketing, finance, economics and quantitative methods so that students who desire to specialize may prepare for careers in these areas.

Each student is required on entering the upper division to fulfill the following minimum requirements for graduation:

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*For students who intend to earn a Secondary Teaching Credential, four courses in English are required. One of these must be a course in Advanced English Composition.

1. At least 18 term courses (13 of which must be 100 and above) must be completed after fulfilling the requirements of lower division.
2. Electives Subjects not taken as prescribed courses and not included in the student's major sequence may be chosen as free electives to complete the 40 term courses (175 quarter units) required for graduation.
3. A minimum of 12 upper-division courses (60 quarter units) in Business and Economics must be completed during the junior and senior years.

Of the 18 courses taken during the junior and senior years the following are required:

A. Business Core Requirement. A total of six courses (30 quarter units), specifically: Quantitative Methods 100, Finance 121, Management 160, Marketing 181, Economics 114, and Management 162 or Economics 115.

B. Field of Emphasis. A minimum of 20 quarter units beyond the introductory course (core) in one field. The following fields of emphasis are approved: Accounting, Quantitative Methods, Economics, Finance, Administration, and Marketing.

A student who, for very important reasons, does not wish to elect one of the preceding fields of emphasis may on written petition to the undergraduate committee receive permission to elect a general business program.

The above required subjects give the students the training necessary in preparing them to have a broad business outlook. With courses in marketing, management, finance, economics, and accounting in their required programs, students are prepared to grasp and cope with the complicated problems of management. They are not limited in their analysis of these varied problems to any one phase of the operations of a company, but are equipped to consider all aspects.

All students must complete a minimum of 175 quarter units for the Bachelor of Science in Commerce degree.

School of Engineering

The undergraduate degrees are earned by completion of 40 term courses with an overall grade average of at least C (2.0). The curriculum consists of 10 courses in the humanities and social sciences (3 being in religious studies), 17 courses in a core program of mathematics, science and engineering, and 13 courses required or approved by the department in which the degree is being earned.

The core program consists of the following courses: Mathematics 11, 12, 13 and 21; Chemistry 1 and 4; Physics 4, 5 and 6; Engineering 10, 15, 41 and 42; Electrical Engineering 101 and 102; Mechanical Engineering 120 and 121.

These 40 courses, are scheduled: 11 during each of the first two years, and nine each in the junior and senior years. The following program is typical for an Engineering degree program. It is followed by a listing of the 13 courses required in each degree program. When a course is followed by an F,W, or S, it means that it can be scheduled in an alternate quarter. A twelfth, optional course can be scheduled in any term in either of the first two years, but is not a degree requirement.

Freshman

Mathematics 11	Mathematics 12	Mathematics 13
Chemistry 1	Chemistry 4	Physics 4
Engineering 10 (F,W,S)	Engineering 15 (F,W)	
Liberal Elective (F,W,S)	Religious Studies (F,W,S)	Optional Course (F,W,S)

	Sophomore	
Mathematics 21	EE 101 or ME 120	EE 102 or ME 121
Physics 5	Physics 6	Liberal Elective (F,W,S)
Engineering 41	Engineering 42	_____(F,W,S)
Liberal Elective (F,W,S)	Religious Studies (F,W,S)	Optional Course (F,W,S)
	Junior	
EE 101 or ME 120	EE 102 or ME 121	Liberal Elective (F,W,S)
Liberal Elective	_____	_____
_____	_____	_____
	Senior	
Liberal Elective (F,W,S)	Liberal Elective (F,W,S)	Religious Studies (F,W,S)
_____	_____	_____
_____	_____	_____

Students in electrical engineering should take EE 101 and 102 as sophomores. Other engineering students may defer selected upper division core courses (courses numbered 100-200) to the junior or senior year, but the sooner they are taken the greater will be the flexibility in arranging upper division programs.

The following are the departmental requirements.

Civil Engineering: 10, 20, 121, 130, 131, 133, 135, 140, 145, Engineering 43 and 3 technical electives.

Electrical Engineering and Computer Science: 104, 111, 131, 151, 161, 198, Physics 11, Applied Mathematics 106, 4 technical electives and 2 free electives.

Mechanical Engineering: 15, 110, 111, 125, 135, 140, 142, 198, Engineering 43, Applied Mathematics 106, and (108 or 118), and 2 free electives.

Senior Thesis. All students seeking a degree in Engineering are required to submit a thesis during their senior year.

The senior thesis provides a student with the opportunity to carry out an original investigation in an orderly fashion, the momentum of progress being supplied primarily by the student's enthusiasm, interest, and effort. The project is scheduled throughout the senior year and must be submitted before the student is admitted to his final examinations.

It is felt that a good undergraduate thesis:

1. Should involve an element of originality. It should be an investigation on the frontier of the student's knowledge.
2. Should require an element of design, an element of equipment assembly and utilization of instrumentation and a test program.
3. Should include successful evaluation of results utilizing sound test techniques and application of fundamentals of engineering. It is desirable that the evaluation require an extension of previous information to cope with the thesis project.

The Department chairman appoints a thesis advisor. The advisor will approve the thesis subject and method of approach, the outline of the thesis, initial drafts and final copy of the thesis as the project develops.

The Bachelor of Science in Engineering Degree Program

The Bachelor of Science in Engineering degree program was developed to accommodate students whose educational objectives require more curricular flexibility

than traditional engineering curricula generally permit. What these students seek is frequently not well served by branching from existing engineering disciplines but rather by merging of principles and approaches drawn from all fields of engineering and other disciplines in the university.

At least three types of students will be interested in this program:

1. Those who plan to do graduate study in fields other than engineering including law, medicine, business, or education.
2. Those who need to develop a special interdisciplinary program in anticipation of study in marine engineering, computer science, systems engineering, and similar hybrid concentrations.
3. Those who wish to develop experimental programs to study in areas of great current interest such as environmental or ecological systems relating technical-social-economic-political constraints.

The program of studies should be developed as early as possible with the help of an academic advisor so that degree requirements can be met and courses of special interest scheduled at the time they are offered. The program of studies is then approved by the Dean of the School of Engineering and filed with the Registrar.

In addition to the previously listed 27 courses required for all engineering degrees the remaining courses must include:

A thesis
Applied Mathematics 108 and 118
Civil Engineering 43
Three courses in an analysis-design sequence in engineering.
Typical sequences are: CE 130, 131, 133; EE 104, 111, 112; or ME 110, 111, 112.

The Part-Time Student Program in Engineering

The School of Engineering is sensitive to the needs of a student who must work while attending the university. As a consequence, special sections are scheduled between 7 and 9 a.m. so that a student may attend class before going to work. These sections are scheduled so that a student may complete the junior and senior years in a three or four-year period.

GRADUATION HONORS

A candidate for an undergraduate degree who has a grade-point average of 3.40 graduates Cum Laude; one who has a grade point average of 3.65, Magna Cum Laude; one who has a grade point average of 3.85, Summa Cum Laude.

Honors will be based on all graded undergraduate courses attempted at the University of Santa Clara or elsewhere. Transfer students must complete at least two full years at the University to be eligible for honors, and honors will not be awarded superior to what would be merited by the student's record at the University.

Academic Programs

THE SANTA CLARA PLAN

The purpose of the Santa Clara Plan is to minimize the diffusion of each student's interest and concentration by limiting the number of courses taken at any one time, and so to maximize the opportunities for independent study.

Dividing the academic year from September to June into three eleven-week terms and restricting the course load to either three or four courses per term allows the student to concentrate more effectively on a limited number of subjects at any one time. Yet throughout the four years there is ample opportunity for the student to explore a wide range of interests relating either directly or indirectly to his major field of study.

HONORS PROGRAM

The Honors Program is designed to meet the University's responsibility to its superior students by allowing them to pursue an Honors curriculum while majoring in any field. Lower division study for Honors students is a combination of seminars, limited to about 15 students, and lecture courses which presuppose work beyond the usual high school level. In junior and senior years Honors students work intensively in their areas of specialization. Much of their upper division work will be in seminars and directed research. Various Pass-Fail options encourage better use of electives outside their major fields. Special counseling opportunities and registration privileges are available for Honors students which enable them to create the curricula best suited to their abilities, preferences and future professional needs.

Students are considered for admission to the Honors Program on the basis of their high school records, Scholastic Aptitude Test scores, letters of recommendation, and expressed interest. To be considered, students must have a 3.50 high school grade point average and a 1350 SAT score (including a 650 verbal score). About 30 freshmen are accepted into the Program each year as probationary Candidates for Honors and are given full Honors status during the Spring Term of the freshman year after two terms of successful Honors performance. To remain in the program, students must satisfy their instructors that they are doing work of Honors caliber as well as maintain a 3.0 cumulative grade point average.

Toward the end of their freshman year, Honors students who have demonstrated exceptional academic responsibility are designated Honor Scholars, are released from all University requirements, and are permitted to follow a personalized program of studies during their next three years. Honors Scholars are chosen and counseled by a committee made up of their Dean, Department Chairman, and the Director of the Honors Program.

The award "Honors at Entrance" which the University awards to high school students at high school commencement ceremonies does *not* constitute admission to the University Honors Program, nor is it related to the Honors Program in any other way.

PRE-MEDICAL PROGRAM

Admission to medical school is not dependent on any particular undergraduate concentration, nor is it guaranteed by graduation from Santa Clara. Programs which satisfy the requirements prescribed by the Council of Education of the American Medical Association are offered by most of the departments in the College of Science including Biology, Chemistry, and Physics as well as some of the departments in the College of Humanities. Although the curriculum may be arranged in such a way that the student may comply with the requirements for entrance to medical schools in three years, nevertheless, medical schools generally prefer that the student spend four years in preparation and include such cultural courses in his programs as will better fit him for the practice of medicine. The Pre-medical Advisor of the Biology Department, in conjunction with the student's own academic advisor, will assist him in preparing his program in the major of his choice. Prospective applicants for admission to medical schools are urged to study ADMISSION REQUIREMENTS OF AMERICAN MEDICAL COLLEGES INCLUDING CANADA which is published each year and is available from the Association of American Medical Colleges, 2530 Ridge Avenue, Evanston, Illinois 60201.

PRE-DENTAL PROGRAM

Pre-dental programs meeting all the requirements for entrance into dental schools are offered by most of the departments in the College of Science including Biology, Chemistry, and Physics as well as some of the departments in the College of Humanities. The Pre-dental Advisor of the Biology Department, in conjunction with the student's own academic advisor, will assist him in preparing his own program in the major of his choice. ADMISSION REQUIREMENTS OF AMERICAN DENTAL SCHOOLS is published each year and is available from the American Association of Dental Schools, 211 East Chicago Avenue, Chicago, Illinois 60611.

PRE-LEGAL PROGRAM

There is no one best preparation for the study of law. Admissions officers in the best law schools look to breadth of background and quality of work. All concerned with the law and its teaching, however, agree that the ability to write and to speak with clarity and precision is of paramount importance. A course in accounting is virtually essential. This can be said about other preparation: a broad foundation in the social sciences, coupled with a careful selection of courses in English, history, and speech, is most desirable. The precise selection of courses will vary with the major and with the different needs and aptitudes of the student.

PRE-TEACHING PROGRAM

Preparation for prospective teachers is offered by the Department of Education. The Department assists prospective teachers to plan their undergraduate programs so as to include courses that will best prepare them for entering a credential program.

COLLEGE OF HUMANITIES

John H. Gray, S.J., Ph.D., *Dean*

The College of Humanities confers the degree of Bachelor of Arts in English, Fine Art, French, General Humanities, German, History, Italian, Philosophy, Religious Studies, Spanish and Theatre Arts.

In addition to these departments, the College also has departments of Classics and Music which do not have major programs. The Department of Education offers an undergraduate pre-teaching program for prospective teachers.

The Graduate School of the College of Humanities offers programs leading to the California State Teaching Credentials, and confers Master of Arts degrees in Education, English, and History. A full description of all graduate programs is given in the *Bulletin of the Graduate School of Humanities.*

COLLEGE OF HUMANITIES
DEPARTMENT OF THE CLASSICS

George Sullwold, Jr., Ph.D., *Acting Chairman*

Associate Professors: George Sullwold, Walter Kropp, S.J.
Assistant Professor: Douglas Olcott, Ph.D.

Credit will not be allowed for a classical language which duplicates any of the first four semesters of secondary-school credit in the language or courses completed in another institution of collegiate grade. The first year of secondary-school credit in a language is considered to be equivalent to the first-quarter course in college; each successive year of credit in the same language is equal to one additional course in a sequence of four quarter courses in college. The student, however, must present himself to a member of the department for course placement.

MAJOR: The Department of the Classics does not offer a major, but a student may take the Humanities Major and specialize in any one of four programs in The Classics: Latin, Greek, Latin and Greek, or Classical Studies. Twelve courses are necessary for any one of the programs.

Greek

1. ELEMENTARY GREEK I

For beginners. Reading in Attic Greek is combined throughout with the learning of forms, vocabulary, and syntax.

2. ELEMENTARY GREEK II

Continuation of 1.

11. INTRODUCTION TO ATTIC GREEK

For those who enter with non-Attic Greek only, or who need to review elementary Attic. Others may take this course with instructor's permission.

12. ATTIC PROSE

Continuation of 11.

21. INTERMEDIATE GREEK I

Xenophon and/or Plato. Prose Composition. Prerequisite: 2 or 12.

22. INTERMEDIATE GREEK II

Continuation of 21.

61. CLASSICAL CIVILIZATION

See English 61.

65. GREEK MYTHOLOGY

See English 65.

100. HOMER I, Selections

101. HOMER II, Selections

110. CLASSICAL DRAMA

See English 110.

111. SOPHOCLES OR EURIPIDES

112. SOPHOCLES OR EURIPIDES

Continuation of 111.

120. THUCYDIDES, HERODOTUS

121. HISTORY OF GREECE

123. CLASSICAL FICTION in English

The Greek Romances and Lucian, Petronius and Apuleius.

125. COMPOSITION AND SIGHT-READING I

126. COMPOSITION AND SIGHT-READING II

130. PLATO

131. THE ART OF ANCIENT GREECE

140. AESCHYLUS

150. THE ORATORS

160. COMEDY OF ARISTOPHANES IN ENGLISH

170. PINDAR, LYRIC POETRY

180. NEW TESTAMENT, Selections

199. DIRECTED READING

Latin

Students who have entered Santa Clara with Latin credit should consult with a member of the department to determine at what stage they should begin here.

1. ELEMENTARY LATIN I

For beginners. Reading in Latin is combined throughout with the learning of forms, vocabulary, and syntax.

2. ELEMENTARY LATIN II

Continuation of 1.

3. ELEMENTARY LATIN III

Continuation of 2.

20. REVIEW OF GRAMMAR, READINGS IN LATIN PROSE

Designed for students who wish to review Latin and prepare for 21 or 22.

21. INTERMEDIATE LATIN I

Readings from Cicero's Orations. Prose Composition. Prerequisite: 3 or 20.

22. INTERMEDIATE LATIN II

Readings from Vergil's Aeneid, Books VII-XII.
Normally for students with 4 years of high school Latin.

100. CAESAR, Selections

105. CICERO, Selected Philosophical Dialogues

106. CICERO, Selected Orations

107. CICERO, Letters

110. TERENCE AND/OR PLAUTUS

115. MEDIEVAL LATIN

120. VERGIL, Selections from the Aeneid

121. VERGIL, The Eclogues and Georgics

125. COMPOSITION AND SIGHT-READING

126. ADVANCED COMPOSITION I

140. HORACE, The Odes and Epodes

150. OVID, Selections

170. ADVANCED COMPOSITION II

180. LUCRETIUS

199. DIRECTED READING

COLLEGE OF HUMANITIES
DEPARTMENT OF EDUCATION

Kenneth E. Blaker, Ph.D., *Chairman*

Professor: Gerald E. McDonald
Associate Professors: Louis I. Bannan, S.J., Kenneth E. Blaker, William W. Yabroff
Assistant Professors: James A. Fulton, Mary Anne Smith, Iris M. Tiedt, Jo Ann Vasquez

Pre-Teaching Advisement

Undergraduate students who wish to enter the teaching profession are urged to attend the orientation lectures and the seminars provided by the Department of Education. Several academic departments in the Colleges of Humanities and Sciences have designed curricula for prospective teachers. Students who aspire to teaching are encouraged to seek advisement from their major departments and from the Department of Education during their undergraduate studies in order to prepare themselves for studies leading to a teaching credential.

The California Teacher Preparation and Licensing Law of 1970 is in the process of being implemented, undergraduate students seeking teaching credentials will be affected in various ways; consequently they are strongly advised to consult with the Director of Teacher Education regarding their undergraduate studies.

Teaching Credential Program

The University of Santa Clara is accredited by the California State Board of Education to recommend qualified candidates for a credential to teach in public schools. Persons seeking this credential must first be admitted to the *Teacher Credential Program*. An appropriate undergraduate degree, plus a postgraduate year of studies is required to be fully credentialed, but a *preliminary* teaching credential is obtainable upon completing the Teacher Credential Program during the Senior year.

In order to obtain the *preliminary* teaching credential, students must begin planning their program of studies during their Freshman year, although formal application for this program should be made during the Junior year. Basic qualifications for admission to the Teacher Credential Program are:

1) Completion of the specific requirements for the desired credential,
2) Maintenance of a 3.00 gpa in their major field and a 2.75 accumulative gpa.

In the selection of students seeking to prepare for the teaching credential, the Committee on Teacher Education will also consider the applicant's character, aptitude, commitment to teaching, physical and mental health, citizenship, concern for people, and the quality and pattern of academic preparation.

99. PRACTICUM IN EDUCATION

Opportunity for working as teacher-aides. Includes discussion seminars and directed readings. Permission of instructor required.

108. HISTORY OF EDUCATION

The historical development and growth of American public schools, elementary and secondary. The influence of leading educators and major educational trends are considered.

110. CURRICULUM AND INSTRUCTION IN SPECIALIZED AREAS

A study of curriculum and instruction in specialized fields at the secondary level. Techniques of selecting instructional materials, evaluating student progress, and developing curriculum.

112. EDUCATION IN AN ERA OF CHANGE

An analysis of the status and direction of American education in the middle decades of the twentieth century. Stress is placed upon examining the nature and conditions of current school conflict and recent criticisms of the public school system.

119. PSYCHOLOGY OF EDUCATION

Introduction to theories of learning and their implementation in the classroom. The construction and uses of criterion-referenced objectives and their effects on learning. Testing and measurement concepts as they apply to classroom

evaluation. Some problems confronting academically and socially disadvantaged students and techniques for alleviating these.

120. INTRODUCTION TO TEACHING (fall quarter)

This course is the first part of the experiential sequence (ED 120, 121, and 122). It serves to introduce the student to curriculum and instruction in the public schools at all levels. Morning practicum experience is supplemented with a weekly seminar. Prerequisite: Admission to the Teaching Credential Program.

121. DIRECTED TEACHING I (winter quarter)

Directed teaching under the supervision of an experienced resident teacher in the public schools. Students are assigned to specific teaching positions in the morning while taking coursework in the afternoon (ED 150, 151, and 152), thereby facilitating the interrelating of theory with practice. Prerequisite: ED 120.

122. DIRECTED TEACHING II (spring quarter)

Continuation of ED 121 Directed Teaching I.

134. CURRICULUM IN ELEMENTARY SCHOOLS: LANGUAGE ARTS

Provides an overall view of content taught in elementary school language arts. Emphasis is placed on instructional strategies and the books and materials used in the elementary classroom. Prerequisite: Admission to the Teacher Credential Program.

135. CURRICULUM IN ELEMENTARY SCHOOLS: ARITHMETIC, SOCIAL STUDIES, SCIENCE

Survey of subject matter taught in the elementary school, with the exception of language arts (see ED134). Students are actively engaged in examining and working with instructional strategies, books, and materials related to the elementary curriculum. Prerequisite: Admission to the Teacher Credential Program.

150. EDUCATIONAL FOUNDATIONS I (fall quarter)

A team-taught course designed to blend the areas of educational philosophy, psychology, curriculum and communications. It is designed to provide the student with the broad, substantive background necessary for becoming a professional in education. Prerequisite: Admission to the Teaching Credential Program.

151. EDUCATIONAL FOUNDATIONS II (winter quarter)

Continuation of ED 150 Educational Foundations I.

152. EDUCATIONAL FOUNDATIONS III (spring quarter)

Continuation of ED 151, Educational Foundations II.

184. THE INSTRUCTION OF READING

A survey and study of approaches, methods, and practices in reading instruction. Prerequisite (for undergraduate only): Admission to the Teaching Credential Program.

199. DIRECTED RESEARCH IN EDUCATION

Opportunity for independent research and experience in education. Experience in elementary and/or secondary classrooms. Permission of the instructor is required.

COLLEGE OF HUMANITIES
DEPARTMENT OF ENGLISH

George J. Sullwold, Jr., Ph.D., *Chairman*

Professors: James P. Degnan, Francis X. Duggan
Visiting Professor: Sister Mary Louise Beutner
Associate Professors: John H. Gray, S.J., Christiaan Lievestro, Charles T. Phipps, S.J., George J. Sullwold
Assistant Professors: Edward D. Gross, Eleanor Long, Elizabeth J. Moran, Felton G. O'Toole, S.J., Richard M. Schmidt, Joseph Subbiondo, Frederick Tollini, S.J.
Acting Assistant Professor: Theodore Rynes, S.J.
Lecturers: Albert DiPippo, William J. Rewak, S.J., James Torrens, S.J.

Bachelor of Arts

A student majoring in English may elect one of five different programs. An English major consists of twelve courses taken in the Department with an average grade of C.

Program A: English Literature

Program A is the standard English Major designed for students who are planning to continue their study beyond the B.A. degree. It is also a good, solid program for the general student.

Lower Division: 4 courses
- 2 courses from either sequence
  - A. 46, 47, 48
  - B. 61, 62, 63
- 2 courses from 25, 27, 28, 36, 37, 38, 65, 66.

Upper Division: 8 courses
- 3 period courses from 120, 121, 122, 155, 156, 157
- 1 Shakespeare: 116, 117, 118
- 1 Chaucer, 152, 153
- 3 Electives in U. D. English courses
- Strongly recommended: one from 104, 105, 106.

Program B: General English

Program B is designed for the student who is not planning to do graduate work in English. This program is, however, suitable for those planning to obtain teaching credentials; to do further study in journalism, language and linguistics; to enter law school. The heart of this program is a three-course sequence in some special field.

Lower Division: 4 courses

The same as for Program A.

Upper Division: 8 courses

1 author course: Shakespeare, Chaucer, Milton

3 related courses chosen from these nine groups:

a. Language and Linguistics: 100, 101, 102, 103.
b. Writing: 171, 172, 173, 174, 175.
c. Fiction: 124, 125, 126, 127.
d. Drama: 110, 111, 112, 113, 114, 115, 116, 117, 118, 119.
e. American: 119, 126, 130, 131, 149.
f. Medieval: 100, 152, 153, 155.
g. Renaissance: 116, 117, 118; 156, 157, 158.
h. Modern: 112, 115, 121, 122, 127, 160, 165.
i. Criticism: 104, 105, 106.

4 Electives from U. D. English courses.

Program C: American Studies

Program C is designed for students who wish to combine the study of literature with history and the social sciences. This program is suitable for pre-law students, as well as the general student. A number of universities offer graduate programs in American Studies.

Lower Division: 4 courses

36, 37, 38.

1 Elective from L. D. English courses

Recommended: 66

Electives in U. S. History, Political Science, Sociology, and Economics

Upper Division: 8 courses

4 English

130, 131 & two from 119, 126, 149.

4 U. S. History and Social Science

Recommended Electives: Courses in English Literature

Program D: Dramatic Literature

Through the cooperation of the Departments of English and Theatre Arts, a student may specialize in Dramatic Literature. The specialization consists of 12 courses in English and Theatre Arts of which at least 8 must be in Dramatic Literature.

Lower Division—Theatre Arts 55, English 25 and 28. At least one course elected from the following: Theatre Arts 9, 10; English 46, 47, 48, 65, 66.

Upper Division—English 104; one course in Shakespeare; one of the following sequences in its entirety: A. English 110, Theatre Arts 111 and 112. B. English 113, Theatre Arts 114 and 115. Three electives from Upper Division English courses of which at least one must be in something other than dramatic literature.

To satisfy the general requirement in Humanities, the specialist in Dramatic Literature is expected to take English 61, 62, 63.

The specialization in Dramatic Literature is recommended for those students who are primarily interested in drama and who intend to continue study in drama, dramatic literature, drama criticism, or journalism. This specialization is not recommended for students who intend to do graduate work in English Literature with a view to the degree of MA or Ph.D. The Dramatic Literature specialization is however suitable for the degree of MAT in English.

Program E: Comparative Literature

Program E is designed for the student whose interest in literature goes beyond English and American Literature. It is especially suitable for the student who studies abroad during his junior year and consequently has a bit of difficulty in completing Program A. Comparative Literature is excellent preparation for teaching and graduate study.

Lower Division: 4 courses

English 61, 62, 63 and 65 or 66.

Preparation for U. D. work in one or more foreign languages.

Suggested Electives: 25, 27, 46, 47, 48.

Upper Division: 8 courses

English 144 and 145

2 selected from English 104, 105, 106, 110, 111, 112, 127, 149.

4 U. D. courses in the literature of a foreign language.

Highly recommended: 1 or 2 courses in a second foreign language, preferably Latin or Greek.

Recommended English Electives: 116, 117, 118, 153, 155.

Courses in Linguistics do not fulfill the 8-course literature requirement.

Program F: Written Communication

Lower Division: 4 courses

2 from 71, 72, 73.

2 from any *one* of 36, 37, 38; 46, 47, 48; 61, 62, 63.

Suggested electives: Any lower division English literature courses.

Upper Division: 8 courses

4 from 171, 172, 173, 175, Theatre Arts 151.

4 upper division English courses, two of which must be in literature.

160, 165, 124–127, 130, 131.

Recommended electives: 106, 107.

Honors Program

Students majoring in English may participate in the University Honors Program. The Department of English offers each year special sections of certain lower division courses limited to Honors students. The Department also offers a specific Honors curriculum for its Honors students and permits them to begin in their sophomore year a series of upper division period courses (155, 156, 157, 120, 121, 122) in place of 46, 47, 48.

Teacher Credential with a Major in English

Candidates for a secondary teaching credential with a major in English are recommended to complete the following program:

1. All requirements for a Bachelor of Arts with a major in English.
   Lower Division—English 1, 2, 3, or English 41, 42. English 46 and 47. English 61, 62, and 63 may be substituted for 46 and 47. Recommended electives: English 48, 65, 66.

   Upper Division—One course in Shakespeare (116, 117, or 118) or one course in Chaucer (152 or 153). Three period courses of which one should concern American literature (130 or 131). One course in Language and Linguistics (101, 102, 103). One course in Advanced Composition (174 or 175). One free elective.
2. During the fifth year at least two English courses are required. These courses may be the recommended courses in Language and Linguistics or in Advanced Composition. Any upper division course may be elected.
3. Education courses as specified by the Department of Education. Education 108, 111, 119 may be taken during the junior and senior years.

Teaching Minor in English

The teaching minor generally consists of thirty quarter units of English including both upper and lower division. The English Department strongly recommends four upper division courses for the minor in English.

Lower Division—English 1, 2, and 3, or 41, and 42. Suggested electives: English 25, 27, 28, 30.

Upper Division—English 101, 102, or 103. For the teaching credential one of the following is required: English 174 or 175. Electives should be chosen to supplement the lower division. Ideally the student should have at least one course in Shakespeare and one course in American literature (119, 126, 130, 131).

1. COMPOSITION AND RHETORIC I

Practice in the fundamentals of expository and critical writing. This course is designed to furnish the student the reading and writing skills necessary for college work. Readings in selected modern essays.

2. COMPOSITION AND RHETORIC II

Continuation of 1. Practice in expository and critical writing. English 2 or 3 will satisfy the requirement for those students who need only two English courses.

3. COMPOSITION AND LITERATURE

Practice in expository and critical writing with emphasis on research techniques and the use of the library. Classes will be arranged for students with special interests.

11. ESL (English as a Second Language)

A course in language arts for non-native-speakers of English (foreign students and some students of ethnic minorities) in substitution for English 1. Practice in reading comprehension (Modern Fiction and Essay) and writing College English.

12. ESL (English as a Second Language)

Continuation of 11. Substitutes for English 2 or 3 for those students who need only two English courses.

13. ESL

English for non-native speakers of English who need practice and help with their academic writing. No prerequisite.

23. SHORT STORY

Selected readings in British and American short stories. Open to all students. Recommended for students who plan to concentrate on writing.

24. WORLD DRAMA

Selected plays of the western tradition, from ancient Greece up to the present century. An introductory course open to all students.

25. CONTEMPORARY DRAMA

Selected readings in dramatic literature. Emphasis on contemporary English, American, and Continental drama. Recommended for students desiring a teaching minor in English.

26. ENGLISH CLASSICS

Selected readings in English literature for non-English majors. Does not satisfy English major requirement.

27. MODERN NOVEL

The changing concept of the novel during the twentieth century. An elective course open to all students.

28. INTRODUCTION TO SHAKESPEARE I

An introduction to the dramatic work. Readings in the major tragedies, comedies, and chronicle plays. Does not fulfill the Shakespeare requirement for English majors, but is recommended for those desiring a teaching minor in English. Winter quarter.

29. INTRODUCTION TO SHAKESPEARE II

Spring quarter.

30. AMERICAN CLASSICS

Selected readings in American literature for non-English majors. Emphasis on modern poets and novelists. Recommended for students desiring a teaching minor in English. Does not satisfy English major requirement.

36. SURVEY OF AMERICAN LITERATURE I

Readings in the history of American literature from Colonial times to the early nineteenth century. Prerequisite: English 1 and 2 or the equivalent.

37. SURVEY OF AMERICAN LITERATURE II

Readings in the history of American literature in the nineteenth century. Prerequisite: English 1 and 2 or the equivalent.

38. SURVEY OF AMERICAN LITERATURE III

Readings in the history of American literature in the twentieth century. Prerequisite: English 1 and 2 or the equivalent.

41. CRITICAL COMPOSITION I

Directed practice in writing literary criticism. Fulfills requirement of 1, for special students.

42. CRITICAL COMPOSITION II

Directed practice in writing literary criticism. Fulfills requirement of 2, for special students.

46. SURVEY OF ENGLISH LITERATURE I

Readings in the history of English literature from the beginnings to 1660. Emphasis on the history of ideas and on the major authors. Recommended for English majors. Prerequisite: English 1 and 2 or the equivalent.

47. SURVEY OF ENGLISH LITERATURE II

Readings in the history of English literature from 1660 to 1832. Emphasis on the history of ideas and on the major authors. Recommended for English majors. Prerequisite: English 1 and 2 or the equivalent.

48. SURVEY OF ENGLISH LITERATURE III

Readings in the history of English literature from 1832 to the present. Emphasis on the history of ideas and on the major authors. Recommended for English majors. Prerequisite: English 1 and 2 or the equivalent.

49. AFRO-AMERICAN LITERATURE

Satisfies Ethnic Studies requirement.

61. HUMANITIES I

Civilization of the Greeks and Romans.

62. HUMANITIES II

Literature and ideas from St. Augustine to Montaigne.

63. HUMANITIES III

Literature and ideas from Descartes to the rise of literary realism.

65. MYTHOLOGY

A study of classical mythology, which considers literary, psychological and anthropological implications. Recommended elective for English majors.

66. FOLKLORE

A study of traditional customs, beliefs, speech-forms, and narratives, with emphasis on the function of such traditions in literature and in contemporary life. Recommended elective for English majors. Satisfies Ethnic Studies requirement.

71. EXPOSITORY WRITING

Practice in writing arguments, editorials, explanations and directions. Recommended for students interested in journalism.

72. CREATIVE WRITING

Poetry and fiction. Practice in writing and editing. Workshop discussions.

73. WRITING AND RESEARCH

Methods of gathering, organizing, and presenting material available in books and articles. This course may be substituted for English 3 by Humanities students.

100. OLD ENGLISH

The morphology and syntax of Old English in selected readings in Old English texts. Alternate years; offered 1973.

101. INTRODUCTION TO LINGUISTICS

General survey of the science of linguistics: phonology, morphology, syntax, grammar, and usage.

102. MODERN GRAMMAR

Analysis of the basic problems of describing grammatical structure: traditional, structural, and transformational-generative grammars.

103. HISTORY OF THE ENGLISH LANGUAGE

An introduction to the study of the English Language: its origin, structure, and development; the growth of vocabulary; syntactic change; usage levels; and elementary phonetics.

104. CRITICISM AND DRAMA

Classical, Neo-classical and modern theories of drama. Readings in the important critics and a study of selected dramas.

105. CRITICISM AND POETRY

Romantic and modern theories of poetry. Readings in the important critics and study of selected dramas.

106. CRITICISM AND FICTION

A review of the theories of fiction with special emphasis on modern criticism. Readings in the important critics and a study of selected works of prose fiction.

107. ENGLISH PROSE STYLE

Changing fashions in the rhetoric of prose from the Middle Ages to the present.

110. CLASSICAL DRAMA

A study of selected Greek and Roman plays in translation. Alternate years; offered 1973.

111. CONTINENTAL DRAMA

Alternate years. See Theatre Arts.

112. MODERN DRAMA

See Theatre Arts.

113. ENGLISH DRAMA I

The history of the drama in England from the beginning to 1660. Emphasis on Elizabethan and Jacobean dramas. Alternate years; offered 1972.

114. ENGLISH DRAMA II

Alternate years. See Theatre Arts.

115. ENGLISH DRAMA III

Alternate years. See Theatre Arts.

116. SHAKESPEARE'S TRAGEDIES

Study of Shakespeare's major tragedies.

117. SHAKESPEARE'S COMEDIES

Study of Shakespeare's major comedies.

118. SHAKESPEARE'S HISTORIES AND SONNETS

A study of the *Richard II-to-Henry V* cycle of chronicle plays, and a study of the sonnets.

119. AMERICAN DRAMA

See Theatre Arts.

120. NEO-CLASSICAL PERIOD

A study of nondramatic literature of England from 1660 to 1798. Alternate years; offered 1972.

121. ROMANTIC PERIOD

A study of the nondramatic literature of England from 1798 to 1832. Alternate years; offered 1973.

122. VICTORIAN PERIOD

A study of the nondramatic literature of England from 1832 to 1900. Alternate years; offered 1973.

124. ENGLISH NOVEL I

The English novel during the 18th Century.

125. ENGLISH NOVEL II

A study of the development of the novel in England during the 19th Century.

126. THE AMERICAN NOVEL

A study of selected major American novels.

127. MODERN NOVEL

Readings of selected major works of modern English, American and Continental novelists.

130. STUDIES IN AMERICAN LITERATURE I

An intensive study of selected authors, trends, and literary problems in American literature during the seventeenth, eighteenth, and nineteenth centuries. Required for the American Studies program. Open to all U. D. students.

131. STUDIES IN AMERICAN LITERATURE II

An intensive study of selected authors, trends, and literary problems in American literature from the late nineteenth-century to the present. Required for the American Studies program. Open to all U. D. students.

140. HUMANITIES SEMINAR

Primarily for Honors students in Science.

144. COMPARATIVE LITERATURE I

A study of classical forms, themes, and stylistic devices and their specific influence and effect on English literature. Alternate years.

145. COMPARATIVE LITERATURE II

A study of the major forms and themes of modern Continental literature and their influence on English literature.

149. AFRO-AMERICAN LITERATURE

Fulfills Ethnic Studies requirement. May be elected as an English major elective.

152. CHAUCER I

A study in Middle English of Chaucer's *Canterbury Tales*, with emphasis upon the language, sources, and genres of the tales.

153. CHAUCER II

A study in Middle English of Chaucer's *Troilus and Criseyde*, with emphasis upon its language and its antecedents in Western European literature (to be read in translation).

155. MEDIEVAL PERIOD

A study in translation of the major movements in English literature from the Norman Conquest to 1485. Alternate years; offered 1973.

156. RENAISSANCE

A study of the nondramatic literature of England from 1485 to 1603. Alternate years; offered 1972.

157. SEVENTEENTH CENTURY

A study of the nondramatic literature of England from 1603 to 1660. Alternate years; offered 1972.

158. MILTON

A study of nearly all the poetry, with emphasis on *Paradise Lost*. Alternate years; offered 1973.

160. MODERN ENGLISH LITERATURE

A study of the nondramatic literature of England from 1900 to the present.

165. CONTEMPORARY LITERATURE

A study of contemporary fiction, poetry, and criticism.

171. FICTION WRITING

A laboratory course designed to give the student instruction and direction in writing. Non-majors may take on a Pass-Fail basis.

172. NON-FICTION WRITING

A laboratory course designed to give the student personal instruction and guidance in writing non-fiction.

173. POETRY WRITING

A laboratory course designed to give the student personal instruction and guidance in writing.

174. ADVANCED COMPOSITION

A course designed primarily for those students who plan to obtain a teaching credential. Practice in writing and editing. Students interested in creative writing may substitute 171, 172, or 173.

175. ADVANCED WRITING

A course of seminars and tutorials for pre-professional and other students seriously interested in improving their ability to write exposition and argumentation. Restricted to students in their senior year. Enrollment by permission of the instructor. If possible, students should take the course for a pass or fail grade.

199. DIRECTED READING

Under special circumstances a student may request a professor to give him a course in directed reading with the chairman's permission. Under no circumstances may directed reading be taken in a subject area in which a course is currently available to the student.

COLLEGE OF HUMANITIES
DEPARTMENT OF FINE ARTS

Terence Netter, *Chairman*

Associate Professor: Terence Netter
Assistant Professors: Paul Kos, John Phillips, Gerald Sullivan, S.J., Irvin S. Tepper

The Fine Arts Department offers a major in Studio Art. This program leads to a B.A. in Studio Art.

A student majoring in Studio Art must complete 12 courses in the department with an average grade of C.

Four of these courses must be lower-division (numbered below 100), including the study of Art History (71).

Of the eight upper-division courses, five must be studio courses; two must be art history courses, including the History of Modern Art, either 183, 184 or 185; the 8th upper-division course, to be taken in the senior year, must be *Senior Thesis* (196) unless exception be made by the chairman. In junior and senior years some students may elect to concentrate in a specific area: painting, drawing, sculpture, printmaking, photography or filmmaking. However, all students will be expected to complete at least one course in each of these areas during his four years.

The emphasis is placed on the development of the individual artistic consciousness and proficiency of each student. Students choosing this major are expected to participate in the creative life of the department as a whole.

The program for all students is ordered not only to teach necessary skills and techniques but also to encourage the creative imagination and an awareness of contemporary art as well as the evolution of aesthetic consciousness. The larger dimensions of art and society, art and philosophy, art and technology will be held in the view of the students who elect Fine Arts courses.

Studio courses require at least twelve hours in the studio per week; six with the instructor and six in independent work. The studios are open to the students every day until 10:30 p.m. and students are encouraged to work in the studios whenever class is not in session. A lab fee may be required for all studio courses to cover the cost of materials.

In addition to the faculty and facilities of the Fine Arts department the University provides the programs at de Saisset Art Gallery, on campus. The many galleries and museums in the Bay Area are ready accessible to the students of the University.

10. PHOTOGRAPHY I

Introduction to photography as a creative art form. Includes study and practice of various techniques and equipment. Extensive work in the darkroom is required but the emphasis is on creative expression.

11. PHOTOGRAPHY II

Continuation of 10.

21. FILM MAKING I

Introduction to the theory and practice of film making as a creative form of expression. Course covers the production techniques of film as well as the history of film. The objective of the course in some cases will be to produce a finished film in either 8 or 16 mm, but in every case, to achieve an awareness of the history and possibilities of film as an art form.

22. FILM MAKING II

Continuation of 21.

31. DRAWING I

Introduction to various drawing media and techniques as well as to the problems of self-expression involved in classical and contemporary drawing as an art form.

32. DRAWING II

Continuation of 31.

41. PAINTING I

Introduction to the basic skills and concepts requisite for self-expression in oils and acrylics with an emphasis on color and composition as used for creation in two dimensional art forms.

42. PAINTING II

Continuation of 41.

51. SCULPTURE I

Introduction to the fundamentals of art in three-dimensional form, including materials and techniques as well as the problems of form and expression peculiar to this art.

52. SCULPTURE II

Continuation of 51.

61. PRINTMAKING I

Introduction to the art of printmaking, using the techniques of woodcut, linocut, and collograph, etc., to familiarize the student with problems of form and expression peculiar to the graphic arts.

62. PRINTMAKING II

Continuation of 61.

71. THE STUDY OF ART HISTORY

A study of the art of seeing, perceiving and interpreting painting, sculpture and architecture. Beginning with the examination of immediate visual qualities in works of art, this course raises various aesthetic and critical problems in the attempt to place the object in its fuller historical context. Emphasis is on the student's ability to understand the concepts and tools of art history rather than on the coverage of a given number of works of art. REQUIRED OF ALL FINE ARTS MAJORS.

101. ADVANCED PHOTOGRAPHY

Study of photography as creative individual expression in a number of contemporary forms such as photo-silkscreen, multiple images, holograms, etc. Extensive studio work required plus readings in the nature of the photographic image and its history. Prerequisite: Photography 10.

102. ADVANCED PHOTOGRAPHY II

Continuation of 101.

103. ADVANCED PHOTOGRAPHY III

Continuation of 102.

121. CREATIVE FILM MAKING I

An exploration of the theory and practice of contemporary film making and the technological possibilities of low-budget one-man productions. Each student must complete a film in 8 or 16 mm.

122. CREATIVE FILM MAKING II

Continuation of 122.

124. HISTORY OF CINEMA

Study of film theory from Eisenstein through Snow and an inquiry into the aesthetics of film and film criticism. No studio work. Extensive readings.

126. VIDEO AS AN ART FORM

A study of the transition from film to television to video art, especially as used in conceptual art. Emphasis will be placed on the actual production of videotapes. Prerequisite: Either 10 or 21.

131. LIFE DRAWING

Drawing from life in various media stressing not only the techniques of composition, perspective, some knowledge of anatomy, etc., but also the possibilities of creative drawing. Prerequisite: 31.

132. LIFE DRAWING II

Continuation of 131.

133. LIFE DRAWING III

Continuation of 132.

141. ADVANCED PAINTING

Involves working in the various styles and techniques of paintings to find personal styles and manner of self-expression. Prerequisite: 41.

142. ADVANCED PAINTING II

Continuation of 141.

143. ADVANCED PAINTING III

Continuation of 142.

146. PORTRAITURE

The art of making classical and contemporary portraits in oils and acrylics. Prerequisites: 31 and 41.

147. LANDSCAPE

The art of making landscapes, indoors and outdoors in oils and watercolors. Prerequisite: 41.

151. ADVANCED SCULPTURE

A study of the concepts and technique involved in the projection of contemporary sculpture, using materials such as plaster, plastics and metals. Prerequisite: 51.

152. ADVANCED SCULPTURE II

Continuation of 151.

153. ADVANCED SCULPTURE III

Continuation of 152.

155. KINETIC SCULPTURE

An exploration of the concepts and engineering skills needed in the creation of moving sculpture. By permission of the instructor.

156. CONCEPTUAL ART

Theory and practice behind the contemporary form of sculpture known as "conceptual art." The students will be required to conceive and product works of visual art which will not endure as "objects" but as experiences both for himself and the viewers. Readings, slides and extensive studio work. Prerequisite: 41 or 51.

162. SILKSCREEN

The techniques and concepts requisite for making silkscreened prints as an art form. Prerequisite: 61.

163. LITHOGRAPHY

The techniques and concepts requisite for lithography (prints from a stone) as an art form. Prerequisites: 31 and 61.

164. ETCHING

An intaglio printing technique on metal plates through a creative process of drawing, etching with acids, and printing. Imaginative use of the age-old art form is stressed. Prerequisites: 31 and 61.

165. CERAMICS I

The aesthetics and techniques of making three-dimensional art forms, including firing, glazing and pottery. Prerequisite: 51.

166. CERAMICS II

Continuation of Ceramics I.

171. GREEK ART

Beginning with Minoan-Mycenean art, a chronological sequence is followed through the Geometric, Early Classical, High Classical, Fourth Century (Late Classical), and Hellenistic periods in architecture, painting, sculpture, metal work and ceramics. The course attempts to give insight into the personalities of the early Greek artists and considers how the Greek people felt about their art and artists.

172. ROMAN ART

Roman art from the pre-historic and Etruscan periods through Early Christian.

173. EARLY CHRISTIAN ART

Tentative for 1973–74.

175. GOTHIC ART

Tentative for 1973–74.

176. ITALIAN RENAISSANCE ART

Tentative for 1973–74.

178. MICHELANGELO AND THE ITALIAN RENAISSANCE

A study of Michelangelo's paintings, drawings, sculpture, architecture and poetry in the context of contemporaneous artistic and religious developments. Students will pursue independent reports on selected topics such as neo-platonism, techniques in fresco and sculpture, changing concepts of patronage, etc.

180. BAROQUE ART

Tentative for 1973–74.

183. NINETEENTH CENTURY ART: 1780–1990

A study of the movements of neo-classicism, romanticism, realism and impressionism with emphasis on David, Delacroix, Courbet, Manet and Monet.

184. 20th CENTURY ART: 1880–1940

A study of Post-Impressionism, Cubism, Fauvism, Expressionism, Futurism, Dada and Surrealism, with emphasis on Cezanne, Van Gogh, Picasso, Matisse, Kandinsky and Duchamp.

185. 20th CENTURY ART: 1940–1970

Contemporary developments in art from Abstract Expressionism through Pop Art to Conceptual Art.

187. ORIENTAL ART: JAPAN

Tentative for 1973–1974.

188. ORIENTAL ART: CHINA

Tentative for 1973–1974.

189. AFRICAN ART

Tentative for 1973–1974.

190. ART CRITICISM

This course attempts to develop critical judgment in the student's apprehension of painting and sculpture through the evaluation of basic artistic theories and pre-suppositions. Interspersed among theoretical writings by such authors as Leonardo da Vinci, Reynolds, Freud, Mao Tse-Tung, will be actual works of art reflecting a variety of critical problems. Such theories as "art as morality," "art as craft," and "psychoanalytic approaches to art" will be explored.

191. THE STUDY OF ARCHITECTURE

An introduction to architectural thinking through the study of texts (Vitruvius, Frank Lloyd Wright, Louis Sullivan) and of actual buildings.

192. SEMINAR IN ART HISTORY

Tentative for 1973–1974.

193. AESTHETICS THROUGH HEGEL

A study of the different philosophies of art, from Plato to Hegel, which raises and attempts to answer such questions as, what is art? what is the relationship of art to society? is there any disputing tastes?, etc.

194. AESTHETICS TO THIS DAY

A study of different theories of art since Hegel, such as those of Ernst Cassirer, John Dewey, Suzanne Langer, et al. and a confrontation of those problems which face the artist in the contemporary world.

196. SENIOR THESIS

A directed study course for art majors only who wish to prepare a portfolio to present to prospective boards of admissions to graduate programs in studio art.

197. DIRECTED CREATIVE RESEARCH

A seminar for advanced students who want to do an art project not covered by the courses in the catalogue under the direction of one or more members of the Fine Arts Faculty and are willing to meet once a week in a group to discuss their progress with each other and with the teacher leading the seminar.

198. PRACTICUM

An apprenticeship with either a practising artist or practising art teacher as a preparation for life. The students taking this will be required to give visible and written accounts of this experience as well as indication of personal growth. By permission of the chairman only.

199. DIRECTED STUDY

Tutorial work in the areas of art history, aesthetics or studio art. By permission of the chairman only.

COLLEGE OF HUMANITIES
THE B.A. IN GENERAL HUMANITIES

Timothy J. O'Keefe, Ph.D., *Director*

The Bachelor of Arts in General Humanities has been established for those students who feel that none of the traditional single-subject majors meets their educational needs or desires. A student enrolled in this new program composes his own curriculum with the counsel and supervision of a faculty adviser. He may select any one of three kinds of curriculum:

Either (1) a "general studies" curriculum emphasizing several of the humanities rather than a single discipline or subject (such a curriculum can provide an excellent foundation for life, for a teaching career on the elementary or secondary level, or for the study of law);

or (2) an inter-disciplinary curriculum emphasizing two or more closely related subjects (e.g., U.S. or Russian history, literature, and philosophy);

or (3) an entirely original curriculum emphasizing a new discipline or major created by the student himself (e.g., an Ethnic Cultures major, an Ecology major, a Dance Therapy major) possibly including new kinds of courses (e.g., community work under faculty supervision).

This degree program adds a new flexibility to the educational structure at Santa Clara. It gives the individual student a distinct voice in the decision-making process affecting his own education. It is intended to provide a challenge to the creative and enterprising student.

Admission

Any student in good standing who has completed at least one full term at Santa Clara may apply for admission to this degree program. The application must ordinarily be submitted before the second term of the student's junior year. Application forms are available in the offices of the Director of the Humanities Program and of the Dean of Humanities. Required for acceptance is a curriculum of study officially approved by the administration.

A student who wishes to be admitted should in close consultation with an authorized member of the faculty devise his own curriculum study. This curriculum proposal, signed by the student and his adviser, is then submitted together with the application form to the Director. The latter reviews the proposal with his Committee, either approving or disapproving it. If approved, the curriculum proposal is forwarded to the Dean for his authorization; copies are then filed in the office of the Registrar. If disapproved, the proposal will be returned to the student with critical comment. A new or revised proposal may be submitted at any time.

An approved curriculum will be considered binding on both student and University. Once the student has completed the curriculum, he will be awarded the B.A. degree in General Humanities. It is the student's responsibility to complete successfully the curriculum exactly as approved, including any authorized changes.

Regulations

1. Since the program exists to provide educational opportunities not offered by

the traditional major programs, each curriculum proposal should promise reasonable attainment of this objective.

2. No curriculum proposal will be approved unless it offers a sound and challenging curriculum of integrated courses; free electives may be part of any curriculum.

3. Once a proposed curriculum has been approved, any subsequent changes must be approved by the Director and by the Dean. Changes normally will be considered only in the spring term of each year.

4. Students accepted into the program are bound by all general University and College requirements and regulations unless otherwise specified in their approved proposals.

5. At least fifteen courses should be on the upper-division level.

6. At least four courses should be taken outside the College of Humanities.

7. Normally, no student will be permitted to schedule more than one "directed reading" or "individual study" course in a single term.

8. Likewise, no student will be permitted to schedule more than one "directed reading" or "individual study" course from the *same* instructor within a single academic year.

Advisers

The success of the program will depend to a great extent upon the quality of the advice offered a student by his faculty mentor.

A student, therefore, who wishes to enter the program should select his faculty adviser carefully, making sure that the said member of the faculty is particularly qualified to direct a program of study in the student's area of interest. The Director of the Program is prepared to help a student select a suitable adviser.

A student may change his adviser with the approval of the Director.

Committee

The Humanities Program Committee consists of four, experienced, full-time faculty of the College of Humanities and the Director of the Program. The Director will call all meetings of the Committee and he will select, in consultation with the dean and the chairmen of the college, the four faculty who will comprise the Committee.

COLLEGE OF HUMANITIES
DEPARTMENT OF HISTORY

Timothy J. O'Keefe, Ph.D., *Chairman*

Professors: Norman F. Martin, S.J., Matt S. Meier
Associate Professors: E. Thadeus Flood, Timothy J. O'Keefe
Assistant Professors: Ramsdell Gurney, Miles M. Merwin, Peter O. Pierson, David E. Skinner
Acting Assistant Professors: Steven M. Gelber, Istvan I. Mocsy
Lecturer: George F. Giacomini

Students who wish to make History their major subject, besides completing the University and college requirements, must pass twelve courses in History with an average grade of C. The major program must include four lower division and eight upper division term courses. In order to assure breadth in historical studies the History major must take a minimum of three courses in each of the following broad areas: United States, European, and non-Western/Latin American History. It is strongly recommended that History 4 and 5 be taken by all students who have not had a comparable course in high school.

Honor sections and upper division Individual Study courses are offered. Senior Honors students who possess the necessary qualifications may be admitted to graduate seminars by special permission of the chairman and the instructor.

4, 5, 6. WESTERN CIVILIZATION

A history of Western culture from its beginnings to the present, emphasizing those institutions which have shaped modern civilization.

17,18. THE UNITED STATES**

A history of the United States tracing the major political, social, economic and expansionist trends from colonial origins to recent times.

20. EUROPE, AD 285-1350: THE MIDDLE AGES

Late Antiquity and the disintegration of the Roman Empire; the survival of Byzantium; the Barbarians in Western Europe; the appearance of Islam; the Carolingian Empire; feudalism and the Viking Age; Papacy, empire and feudal monarchies; the Renaissance of the 12th century; the high Middle Ages.

21. EUROPE, 1350-1610: RENAISSANCE AND REFORMATION

Autumn of the Middle Ages; the Renaissance as a cultural movement; the religious upheaval and its consequences; Europe and the Ottoman Empire; overseas expansion and the price revolution; Europe divided.

22. EUROPE, 1610-1789: THE AGE OF REASON AND THE OLD REGIME

Continuation of religious and dynastic struggles; advance of scientific thought and its consequences; church, state and social structure; world empires and balance of power.

** Not offered 1973–74.

23. EUROPE, 1789-1852: AGE OF REVOLUTIONS

European political and social upheavals emphasizing the French revolution and Napoleonic Europe. The age of Metternich. The industrial revolution and the growth of the urban masses.

24. EUROPE, 1852-1919: NATIONALISM, SOCIALISM, IMPERIALISM

The intensification of nationalism within Europe ending in the First World War. The competition for empire throughout the world. The growth of international socialism.

25. EUROPE, 1919-PRESENT

The post-war settlement and the challenge of fascism. The Stalin revolution. The second world conflict, the cold war, and the retreat of European empires.

41. HISTORY OF SCIENCE AND TECHNOLOGY

The evolution of science and technology from ancient to modern times. Methods of scientific inquiry; scientific revolutions; function of science and technology in society and their impact upon man and civilizations. The basic purpose of this course is to bridge the gulf between the Humanities and Sciences by demonstrating the underlying conceptual unity of the scientific and non-scientific intellectual experiences.

51. EAST ASIA

A history of East Asia from its beginnings to recent times, with special reference to China and Japan. Traditional institutions. Impact of Western imperialism. Modernization of Japan. Japanese militarism and Sino-Japanese conflict.

55. AFRICA

An historical survey of Africa with emphasis in the early period on cultures and social organization and in the later period on imperialism, colonialism and the development of African nationalism.

61. LATIN AMERICA

A study of political, social, economic and cultural developments and patterns during the pre-Columbian, colonial and national periods. Emphasis is placed on the relevance of geographical, ethnic and historical phenomena to modern Latin American life.

71. UNITED STATES, 1607-1789

A comprehensive course, stressing about equally political, economic, social, and intellectual aspects of American development to 1789. Attention is given to the different interpretations of American history and to the factors that produce new points of view about the nation's past.

72. UNITED STATES, 1789-1840

From Federalism to Jeffersonian Democracy. The War of 1812 and the break from Europe. Emergence of sectionalism and the age of Jackson.

73. UNITED STATES, 18401865

Early economic development. Manifest Destiny and American expansion. Slavery and the old South. The road to the Civil War: domestic impact of the war.

74. UNITED STATES, 1865-1900

Reunion and reconstruction, North and South. Industrialization and exploitation. The closing of the frontier. From isolation to empire.

75. UNITED STATES, 1900-1939

From Roosevelt to Roosevelt. An examination of progressivism at home and imperialism abroad and how they were brought to an end by World War I. The paradoxical twenties as a time of isolation and political conservatism but also a time of widespread social change. The crash as the end of the old order and the New Deal as the beginning of contemporary America.

76. UNITED STATES, 1939-PRESENT

The road to World War II. The domestic impact of the war. The cold war at home and abroad. Trends in recent America. Emphasis on domestic social issues.

81. THE MEXICAN AMERICAN

A broad history of the Mexican American in California and the Southwest. Special emphasis on the period since 1848 and on Texas, New Mexico, and California.

82. THE BLACK AMERICAN

A history of Black Americans from African backgrounds to the end of reconstruction. Students will examine and discuss basic elements in Black history.

91.77 HONORS COLLOQUIUM, EUROPE
92.77

Restricted to Honors Program students. Selected problems in European history. The methods of the historian.

97.77 HONORS COLLOQUIUM, UNITED STATES

Restricted to Honors Program students. Selected problems in United States history. The methods of the historian.

98. LOWER DIVISION SEMINAR

An opportunity for both major and non-major lower division students to explore history in a small group discussion class. Specific subject will vary with different professors.

100. PRO-SEMINAR IN THE THEORY AND PRACTICE OF HISTORY

Practical and theoretical problems of the historian. A critical study of historical writing in a specific area of history. Research and composition are emphasized.

108. WOMEN IN WESTERN SOCIETY

A survey of the role of women in European and American history emphasizing changing attitudes toward women, and the struggle for political, legal and economic equality.

122. THE MIDDLE AGES**

Europe from the end of the ancient world to the eve of the era of discoveries. The development of European societies and institutions; the feudal system, the monarchies, the church and the towns. The advancing of the frontiers of Europe.

123. TOPICS IN EARLY MODERN EUROPE**

A course treating some specific aspect of European history from the fourteenth through the eighteenth centuries. Topics might include: The Italian Renaissance, The Diplomacy of the Old Regime, Calvinism, the Counter Reformation and Revolution.

124. SPAIN

Medieval origins of the Spanish kingdoms and the development of Spanish society. The age of discovery and the Siglo de Oro. European power and overseas empire. Crises of the nineteenth and twentieth centuries.

125. FRANCE IN THE ANCIENT REGIME

A historical study of the development of French society, institutions, thought and culture from the mid-fifteenth century to 1789; and the political and cultural relations of France with the rest of Europe in these years.

126. FRANCE, 1770 TO THE PRESENT

The causes, course and consequence of the Revolution and the Napoleonic period. The struggle between the monarchical and the republican traditions. The political and cultural role of France during the twentieth century.

128, 129. GERMANY

A history of the social, economic, political, and cultural development of the German nation. 128, Germany from 1640 to 1890; 129, Germany from 1890 to the present.

130. HISTORY OF IRELAND

A study of Irish history since the Reformation emphasizing the conflict between the Protestant Ascendancy and the Catholic population. The successive struggles for home rule and an independent republic. The modern division of Ireland.

131, 132. ENGLAND**

The growth of the English state and constitution. The continental ambitions of England during the Middle Ages. The Tudors and the English reformation. The constitutional struggle under the Stuart monarchs. The development of the

** Not offered 1973–74.

modern English government emphasizing the political reforms of the nineteenth century. Britain's role in the modern world.

133. BRITISH COMMONWEALTH**

A study of developments in the British Empire in modern times. The rise of the free dominions and the emergence of autonomous states within that system.

135. HISTORY OF RUSSIA

From the establishment of the Kievan state through the reign of Elizabeth (1762). Concentration upon Muscovite Russia, Peter, and the era of palace revolutions.

136. HISTORY OF RUSSIA

From Peter III's reign (1762) to the fall of the Russian monarchy in 1917. Nineteenth century radicalism, political thought, and culture stressed.

137. HISTORY OF USSR

The evolution of the modern Soviet State from the Bolshevik Revolution, to the deposition of Khrushchev. Emphasis on the causes of the Bolshevik Revolution, Stalinism, Soviet foreign policy and the emergence of USSR as a world power. The USSR in World War II and the Cold War.

138. HABSBURG AND EAST CENTRAL EUROPEAN HISTORY**

Emergence of the medieval kingdoms of Poland, Hungary, and Bohemia. The rise of the House of Habsburg and the establishment of the Danubian empire of Austria. Social and institutional patterns, problems of modernization and reform. Growth of nationalism and the dissolution of the Habsburg Empire.

139. EAST-CENTRAL EUROPE 20TH CENTURY**

East-Central Europe from the Treaty of Versailles through the present day. Emphasis on social and institutional patterns in the inter-war period and on the emergence and nature of the post-World War II socialist regimes in Poland, Yugoslavia, Rumania, Bulgaria, Czechoslovakia, and Hungary.

141. 19TH CENTURY EUROPEAN NATIONALISM**

Selected topics in 19th century European history, emphasizing nationalist expansion during the age of Metternich, the creation of Germany and Italy, and the late 19th century imperial rivalries.

142. THE AGE OF TOTALITARIAN STATES**

Selected topics in 20th century European history emphasizing Fascist and Communist relations with the democratic nations.

144. EUROPEAN DIPLOMATIC HISTORY

A study of the relations of the major European powers since 1870, with emphasis on the economic, political and social forces which influenced these relations.

** Not offered 1973–74.

150. ORIGINS AND DEVELOPMENT OF ISLAM

The Prophethood of Muhammed and the Muslim Revolution. The Islamic conquests and formation of Muslim Institutions. The development of philosophy, law and art during the "golden age" of Islam. The fragmentation of the Muslim empire; the rise of Turkish power; the Crusades.

151. OTTOMAN AND BALKAN HISTORY

Rise of the Ottoman dynasty, conquests of Anatolia, the Balkans and the Eastern Mediterranean. Development of the Ottoman social and political institutions. Causes of decline and reforms during the 19th century. Rise of Balkan nationalism and the disintegration of the Empire.

152. MODERN MIDDLE EAST AND NORTH AFRICA

European Imperialism and the development of Arab Nationalism. Problems of economic development, political stability and military conflict.

153, 154, 155. AFRICA

Africa to 1600; Africa 1600-1850; Africa after 1850. These three courses are designed to offer a basic and intensive historical survey of African cultural institutions, and social and political forces. 153, 154**

156. MODERN JAPAN

Demise of the Tokugawas. Meiji restoration and enlightenment. The liberal movement. Socio-economic transformations. Continental expansion. The democratic experiment. Meiji-Taisho social movements. Special reference to ultra-nationalistic movements. The "Greater East Asia War." Post-war recovery.

157. MAINLAND SOUTHEAST ASIA: FROM COLONIALISM TO NATIONALISM**

A study of political developments from mid-nineteenth century Anglo-French imperialism to the emergence of national states. Particular reference to indigenous nationalist movements in French colonial areas and the modern transition in Thailand.

158. MODERN CHINA

Sociopolitical changes from the late Ch'ing Reform Movement. Special emphasis on modern revolutionary movements, political history of the Kuomintang period, and the rise of the Chinese Communist Party.

159. RELIGION AND SOCIETY IN TRADITIONAL ASIA

Great religious traditions of Asia: a historical survey. Introduction to Brahminism, Theravada Buddhism, Mahayana Buddhism, Confucianism, Taoism and Shintoism and their place in Asian social history.

164. THE INTER-AMERICAN COMMUNITY

A history of the political, economic and social relations between the countries of the two Americas and their activities in regional and world organization.

** Not offered 1973–74.

165. ARGENTINA**

Political, social and economic developments in this leading country of South America from pre-Columbian times to the present, with special emphasis on its modern national development.

166. MEXICO

A history of Mexico from the Mayas and Aztecs to the present. Special emphasis on those factors of the more recent national period, which have contributed to the development of the Mexican national character.

167. BRAZIL

An analytical study of Brazil's past and present: the colonial era, the New World monarchies of Pedro I and II, and the Republic. Emphasis on social and economic developments.

168. LATIN AMERICA: THE NINETEENTH CENTURY

A topical development of Latin America from severance of colonial ties through the experiences of early nationhood: conservatism and liberalism, the caudillos and sectionalism, dictatorship and the oligarchies, nationalism and its consequences. Patterns of cultural growth and of foreign affairs.

169. CONTEMPORARY LATIN AMERICA

A topical study of twentieth century political, economic and social life. The dynamics of traditional legacies and reform programs. Ideals and realities of interamerican relations. Cultural characteristics. Present trends and prospects.

170. THEMES IN COLONIAL AMERICAN HISTORY, 1607-1760

An advanced survey dealing with the religious, political, economic, and social development of the North American colonies in the seventeenth and eighteenth centuries, and the resulting American search for identity.

171. THE AMERICAN REVOLUTION, 1760-1787

An intensive study of the origins, progress, and culmination of the American Revolution. Historiographical themes of the Revolution will be emphasized.

172. TO THE HARTFORD CONVENTION: UNITED STATES, 1787-1820

An examination into the American "worldview" that developed from the social, intellectual, and political components of a period of intensified change.

173. NATIONALISM AND SECTIONALISM**

The social and political reforms and the economic changes between 1815 and the Compromise of 1850, with emphasis on intersectional rivalry.

174. THE UNION IN CRISIS

A study of major aspects of the Civil War and the problems of reconstruction; the abolitionists, the rise of the Republican party; the conduct of the war; the role of the free Negro; constitutional readjustment; the rise of the new south.

** Not offered 1973–74.

176, 177. DIPLOMATIC HISTORY OF THE UNITED STATES

Critical study of the international relations of the United States, and of the economic, political, social and public opinion forces influencing the development of American policy.

180. BLACK INTELLECTUAL THOUGHT

An analysis of the political, literary, economic, and intellectual trends of leading Black thinkers, and social customs of Black people from 1619-1972.

181. THE RISE OF THE CITY

An historical study of the growth and development of the American city and its impact on all aspects of American life.

182. BLACK RESPONSE TO MODERN AMERICA

A study of the social and political institutions developed by the Black community to deal with the discrimination of the dominant society since 1877.

183. SOCIAL MOVEMENTS IN TWENTIETH CENTURY AMERICA

Popular movements for change, and against it. An investigation of the response of the American people to the problems of modern industrial society. Labor, women's rights, Black activism, anti-radicalism, Ku Klux Klan, peace movement, and others.

187. THE WEST**

The spread of the frontier and the emergence of special western problems. The west as a force in United States history and culture, and its effects.

189. CALIFORNIA

The history of California, with major attention given to the period following its annexation to the United States.

190. HISTORIOGRAPHY**

A critical and historical study of the writings of great historians from antiquity to the present, relating them to the philosophical currents and social realities of their times; problems in contemporary historiography.

198. COLLOQUIUM

Group meetings for reading, research, and discussion of selected historical problems and periods.

198.01 England
198.02 Early Modern Europe
198.03 Recent Europe
198.04 Russia
198.05 East Asia
198.06 Latin America
198.07 The United States
198.08 California
198.09 Africa
198.10 Revolution
198.11 Practicum

** Not offered 1973–74.

COLLEGE OF HUMANITIES

DEPARTMENT OF MODERN LANGUAGES AND LITERATURES

Victor B. Vari, Ph.D., *Chairman*

Professor: Victor B. Vari
Associate Professors: Raymond L. Biondi, Andrew I. Rematore, K-G Seely
Assistant Professors: Maurice M. Belval, S.J., Heribert Breidenbach, Agustin A. de la Guardia, Kathleen Mary Glenn, Helene J. Hobson, Christian van den Berghe
Acting Assistant Professor: Elena S. Offstein

The degree of Bachelor of Arts may be taken in French, German, Italian and Spanish. In addition to Language 22, candidates must complete eight upper division courses in their language.

A minor (four upper division courses) is offered in French, German, Italian and Spanish.

Honors students in languages may be admitted to any advanced course for which they have the preparation. They are also eligible for in-course honors projects and independent studies. Honors students are particularly encouraged to include foreign study in their degree plans.

Bachelor of Arts in French

French majors should complete all lower division requirements before the end of their sophomore year. An average of at least C must be maintained in both lower and upper division work. The major program includes eight courses of upper division work. Recommended electives include courses in French or European history, comparative literature, art history, philosophy of language, and linguistics.

Bachelor of Arts in German

German majors should complete all lower division requirements before the end of their sophomore year. An overall average of at least C must be maintained in both lower and upper division work. The major program includes a minimum of eight upper division courses. Recommended elective courses include English 101 (Introduction to Linguistics), and English 102 (Modern Grammar), and History 147 and 148 (European Intellectual History).

Bachelor of Arts in Italian

Italian majors should complete all lower division requirements before the end of their sophomore year. An average of at least C must be maintained in both lower and upper division work. The major program includes a minimum of eight upper division courses. English 65 (Mythology), English 144, 145 (Comparative Literature) and Renaissance History are recommended.

Bachelor of Arts in Spanish

Spanish majors should complete all lower division requirements before the end of their sophomore year. An average of at least C must be maintained in both lower and upper division work. The major program includes eight upper division courses, including Spanish 100, 101 or equivalent. Not more than two survey courses may be included in the minimum eight-course requirement. Courses in the history of Latin America and the history of Spain are recommended. Applied Linguistics (175, 176) is required of Spanish majors in the teaching credential program.

Language Laboratory

During the first four courses in French, German, Italian, and Spanish, and during the first two terms of Russian, students are required to use language laboratory machines approximately half an hour a day to increase their skills in listening comprehension, pronunciation, and speaking. These listen-respond record exercises are supplementary to the required hours of classroom work.

High School Credit and Placement

Students entering from high school with credit for two years of a language will be placed in Elementary Language 2; those with three years will be placed in Language 21; and those with four years, in Language 22. Students may enroll in a higher course with the permission of the instructor.

French

1. ELEMENTARY FRENCH

Development of skills in understanding, speaking, reading and writing French. Laboratory attendance required.

2. ELEMENTARY FRENCH

Continuation of French 1.

5. FRENCH FOR READING

Intensive reading and continuation of grammar. Prerequisite: French 1.

6. INTERMEDIATE FRENCH FOR READING

Reading of scholarly articles, partially in the student's particular field of study. Prerequisite: French 2 or 5.

21. INTERMEDIATE FRENCH

Completion of Elementary texts; introduction of Intermediate reading, conversation and composition.

22. INTERMEDIATE FRENCH

Review of spoken and written French, with accelerated readings.

50. CONVERSATION

100. ADVANCED FRENCH

Intensive speaking and composition. Required of all majors and minors.

101. ADVANCED FRENCH

Introduction to literary analysis. Required of all majors and minors.

110. CULTURE ET CIVILISATION I

Vie intellectuelle et culturelle des pays de langue française.

111. CULTURE ET CIVILISATION II

A continuation of French 110, but may be taken independently.

120. SURVEY OF FRENCH LITERATURE

Development of the major literary currents.

130. SIXTEENTH CENTURY

Renaissance: Readings in Rabelais, the Pléiade poets and Montaigne.

140. SEVENTEENTH CENTURY

Grand Siècle: Evolution of moral, philosophical and literary currents from 1610 to 1715.

150. EIGHTEENTH CENTURY

Siècle des lumières: Studies in the literature and thought of the Age of Enlightenment with emphasis on Voltaire, Diderot and Rousseau.

160. NINETEENTH CENTURY: *Poésie/Théâtre*

Variable studies in the poetic and dramatic movements, with emphasis on the Romantics and the Symbolists.

161. NINETEENTH CENTURY: *Romans et Contes*

Stendhal, Balzac, Flaubert, Zola and others, with emphasis on the Realist and Naturalist movements.

170. TWENTIETH CENTURY: *Poésie/Théâtre*

Variable studies in the contemporary poetry and drama.

171. TWENTIETH CENTURY: *Prose*

Main humanist and stylistic currents in the modern prose from *"la belle époque"* to *le nouveau roman.*

172. TWENTIETH CENTURY: *Cinéma*

Origins and development of French film—with screenings and *travaux pratiques.*

180. SEMINARS

Variable topics in the language and literature. Under advice, may be taken any number of times for credit, but only once for major credit.

183. MOYEN AGE

Epic literature, lyric poetry and theater.

185. FRENCH APPLIED LINGUISTICS

Aspects of Modern French linguistics with special emphasis on phonology and phonetics.

190. DIRECTED READING

Individually designed programs of advanced readings. Written permission of the instructor and the department chairman required in advance of registration.

German

1. ELEMENTARY GERMAN I

Development of skills in understanding, speaking, reading and writing modern German. Daily work in language laboratory required.

2. ELEMENTARY GERMAN II

A continuation of 1.

5. GERMAN FOR READING

Intensive reading and continuation of grammar. Prerequisite: German 1.

6. INTERMEDIATE GERMAN FOR READING

Reading of scholarly articles partially in the student's particular field of study. Prerequisite: German 2 or 5.

21. ELEMENTARY-INTERMEDIATE GERMAN I

Completion of Elementary German, followed by short-stories, progressive exercises in conversation and advanced grammar.

22. INTERMEDIATE GERMAN II

A continuation of 21.

100. ADVANCED GERMAN READING, COMPOSITION AND CONVERSATION I

Required of all German majors and minors.

101. ADVANCED GERMAN READING, COMPOSITION AND CONVERSATION II

A continuation of 100. Required of all majors and minors. Completion or equivalent knowledge will admit students to courses in German Literature.

110. GERMAN CIVILIZATION I

A cultural history of the German speaking countries from the beginning to 1650.

111. GERMAN CIVILIZATION II

A cultural history of the German speaking countries from 1650 to the present.

120. EARLY MASTERPIECES OF GERMAN LITERATURE

130. THE CLASSICAL AGE

140. NINETEENTH CENTURY LITERATURE I: 1800-1830

141. NINETEENTH CENTURY LITERATURE II: 1830-1900

150. TWENTIETH CENTURY GERMAN LITERATURE

151. MODERN DRAMA

160. THE GERMAN NOVELLE

161. SURVEY OF GERMAN LYRIC POETRY

170. SPECIAL TOPICS
Special authors or themes. May be retaken for credit.

190. DIRECTED READING
Individually designed programs of advanced readings. Written permission of the instructor and the department chairman required in advance of registration.

Literature in Translation

N.B. Courses in literature in translation cannot be used as credit toward a German major, teaching minor, or a foreign language requirement.

115. GERMAN LITERATURE IN ENGLISH TRANSLATION

Italian

1. ELEMENTARY ITALIAN I
Development of skills in understanding, speaking, reading, and writing modern Italian. Daily work in language laboratory required.

2. ELEMENTARY ITALIAN II
A continuation of 1.

21. INTERMEDIATE ITALIAN I
Review of fundamentals of spoken and written Italian. Progressive readings reflecting Italian culture and values. Progressive exercises in conversation and composition. Prerequisite: 2 or equivalent.

22. INTERMEDIATE ITALIAN II
A continuation of 21.

100. ADVANCED ITALIAN COMPOSITION, READING AND CONVERSATION I
Required of all majors and minors.

101. ADVANCED ITALIAN COMPOSITION, READING AND CONVERSATION II
A continuation of Italian 100. Required of all majors and minors.

120. SURVEY OF ITALIAN CULTURE AND CIVILIZATION I
From its origin to the "settecento."

121. SURVEY OF ITALIAN CULTURE AND CIVILIZATION II

From the "ottocento" to the present.

130. DANTE, LA DIVINA COMMEDIA (INFERNO and PURGATORIO) I

131. DANTE, LA DIVINA COMMEDIA (PURGATORIO and PARADISO) II

140. DUECENTO, TRECENTO

Emphasis on Dante's minor works. Petrarch's poetry, and Boccaccio's Decameron.

150. QUATTROCENTO, CINQUECENTO (RINASCIMENTO)

Important trends in the literary masterpieces of the Renaissance—significant works of Ariosto, Tasso, Leonardo, Machiavelli, Lorenzo de Medici, Poliziano, Castiglione.

160. SETTECENTO

The salient works of Vico, Goldoni, Parini, and Alfieri.

170. OTTOCENTO

The works of Foscolo, Leopardi, Manzoni, Carducci, Pascoli and Verga will be stressed.

180. NOVECENTO

Italian Literature of Twentieth Century with main trends in poetry, drama and the novel, from Pirandello to the present.

190. DIRECTED READING

Individually designed programs of advanced readings. Written permission of the instructor and the department chairman required in advance of registration.

Russian

1. ELEMENTARY RUSSIAN I

Drill in pronunciation, elements of grammar and vocabulary. Progressive exercises in reading, writing, and speaking. Daily work in language laboratory required.

2. ELEMENTARY RUSSIAN II

A continuation of 1.

21. INTERMEDIATE RUSSIAN I

Review of grammar and syntax. Reading of original authors. Exercises in translation, composition, and conversation. Prerequisite: 2 or equivalent.

22. INTERMEDIATE RUSSIAN II

A continuation of 21.

Spanish

1. ELEMENTARY SPANISH I

Development of skills in understanding, speaking, reading and writing modern Spanish, in that order. Daily work in language laboratory required.

2. ELEMENTARY SPANISH II

A continuation of 1.

21. INTERMEDIATE SPANISH I

Review of fundamentals of spoken and written Spanish. Progressive readings reflecting Hispanic culture and values. Progressive exercises in conversation and composition. Prerequisite: 2 or equivalent.

22. INTERMEDIATE SPANISH II

A continuation of 21.

N.B. Completion of 100, 101 or evidence of equivalent preparation will admit students to higher-numbered courses.

100. ADVANCED SPANISH I

Composition, conversation and grammar. Introduction to literary analysis. Required of all majors and minors. Prerequisite: 22.

101. ADVANCED SPANISH II

A continuation of 100. Required of all majors and minors.

105. SPANISH PRONUNCIATION AND INTONATION

Systematic study of the pronunciation and intonation of modern Spanish. Intended for majors, minors and prospective teachers needing further perfection of these skills. Individual diagnoses. Daily laboratory recording exercises. Prerequisite: 22 or equivalent.

120. SURVEY OF SPANISH LITERATURE I

Readings in Spanish literature from the beginnings to about 1845. Alternate years.

121. SURVEY OF SPANISH LITERATURE II

Readings in Spanish literature of the second half of the nineteenth century. Emphasis on the novel. A continuation of Spanish 120, but may be taken separately. Alternate years.

130. SURVEY OF LATIN-AMERICAN LITERATURE I

Readings in Latin-American literature from the Colonial period to about 1888.

131. SURVEY OF LATIN-AMERICAN LITERATURE II

Readings in Latin-American literature from the Modernista movement to the present.

135. COLLOQUIUM: LATIN-AMERICAN LITERATURE

Topic will vary. Reading and discussion of selected themes in Latin American literature. Prerequisite: course work in Latin American literature or permission of instructor. May be retaken for credit.

140. MODERN LATIN AMERICAN LITERATURE I

Study of major Latin American writers of the late nineteenth and early twentieth centuries with emphasis on the novel. Given in alternate years.

141. MODERN LATIN AMERICAN LITERATURE II

A continuation of 140, but may be taken separately. Given in alternate years. To be offered in 1973–74.

145. CONTEMPORARY LATIN AMERICAN LITERATURE I

Study of major Latin American writers of the mid-twentieth century. Given in alternate years.

146. CONTEMPORARY LATIN AMERICAN LITERATURE II

A continuation of 145, but may be taken separately. Given in alternate years. To be offered in 1973–74.

150. TWENTIETH CENTURY SPANISH LITERATURE I

A study of the major writers of Spain from 1898 to 1936, with particular emphasis on the Generation of 1898.

151. TWENTIETH CENTURY SPANISH LITERATURE II

A study of the major writers of Spain from 1936 to the present.

161. SPANISH GOLDEN-AGE DRAMA

Reading and discussion of representative plays of Lope, Tirso, Calderón, and other dramatists of Spain's Golden Age.

165. CERVANTES: DON QUIJOTE

175. SPANISH APPLIED LINGUISTICS I

Detailed scientific analysis of the phonology of modern Spanish. Contrastive analysis of Spanish and English sound systems. Designed for prospective language teachers.

176. SPANISH APPLIED LINGUISTICS II

Detailed scientific analysis of the morphology and syntax of modern Spanish. Contrastive analysis within the Spanish structure system, and between Spanish and English structure systems. Prerequisite: 175.

190. DIRECTED READINGS IN SPANISH

Individually designed programs of advanced readings. Written permission of the instructor and the department chairman required in advance of registration.

Literature in Translation

N.B. Courses in literature in translation cannot be used as credit toward a Spanish major, teaching minor or a foreign language requirement.

115. TWENTIETH CENTURY MEXICAN LITERATURE IN TRANSLATION

Reading, analysis and discussion of outstanding works by modern and contemporary Mexican writers. Emphasis on the novel. Special consideration given to correlating literature with the total cultural and historical background.

117. LATIN AMERICAN LITERATURE IN TRANSLATION

Reading, analysis and discussion of works of leading Latin American writers, with emphasis on contemporary novelists of South America.

195. DIRECTED READINGS IN LATIN AMERICAN LITERATURE IN TRANSLATION

Individually designed programs of readings. Written permission of the instructor and the department chairman required in advance of registration. To be offered during the summer session.

COLLEGE OF HUMANITIES
DEPARTMENT OF MUSIC

Roger Nyquist, D.Mus., *Chairman*

Associate Professors: Roger Nyquist, Lynn Shurtleff
Assistant Professor: Jesse Parker
Acting Assistant Professor: Milton Ryan
Instructor: Barbara Winklebleck
Artist-in-Residence: Charles Lampkin

The Department of Music offers courses of interest and value to all University students who wish to acquaint themselves with music as one aspect of a liberal culture either as appreciative listeners or as trained participants. Instruction is offered designed to prepare students for careers in the fields of concert, opera, radio and television. There are special curricula for the composer and for the preparation of private teachers, church organists and choirmasters. Scholarship and research are encouraged.

Applied Music

100. ORGAN

102. HARPSICHORD

103. PIANO

104. VOICE

105. VIOLIN

106. VIOLA

107. VIOLONCELLO

108. DOUBLE BASS

109. WOODWINDS

110. BRASS

111. PERCUSSION

112. JUNIOR RECITAL
Forty-five minute recital.

113. SENIOR RECITAL
Seventy-five minute recital.

114. SENIOR THESIS
For Theory, History and Composition majors. A comprehensive paper or composition approved by the faculty.

Ensemble

71, 171. UNIVERSITY CHORUS

Open to selected students for preparation and performance in concert of works of the significant choral literature. Credit available only after three terms of membership.

72, 172. UNIVERSITY CHAMBER SINGERS

73, 173. UNIVERSITY ORCHESTRA

Open to selected students for preparation and performance in concert of works of the significant orchestral literature. Credit available only after three terms of membership.

Music History and Literature

20. INTRODUCTION TO MUSIC

How to listen to music; art of music and its materials; instruments and musical forms; music of the 17th through 20th centuries. Non majors. Prerequisite to all classes in the Department of Music.

21. MUSIC OF ANTIQUITY THROUGH THE RENAISSANCE

A history of western music from its beginnings through the 16th century.

22. MUSIC OF THE BAROQUE ERA

A history of the important musical developments from 1600 to 1750.

23. MUSIC OF THE ROCOCO AND CLASSIC ERAS

A history of the important musical developments from 1725 to 1830.

24. MUSIC OF THE ROMANTIC ERA

A history of the important musical developments from 1800 to 1900.

25. MUSIC OF THE 20TH CENTURY

A history of the important musical developments from 1900 to the present.

26, 126. HISTORY OF KEYBOARD MUSIC

From 1500 to the present. Open to Non Majors.

127. ORGAN LITERATURE

A survey of the important organ literature from 1500 to the present.

128. PIANO LITERATURE

A survey of the important vocal literature from 1700 to the present.

129. VOCAL LITERATURE

A survey of the important vocal literature from 1600 to the present.

30, 130. CHORAL LITERATURE

Sacred and secular music from 16th century to the present. 1. Smaller forms: motets, anthems. 11. Larger forms: oratorios, cantatas.

31, 131. HISTORY OF OPERA

From 1600 to the present. Open to Non Majors.

32, 132. THE SYMPHONY

The development of symphonic music. Detailed analysis of representative works for the symphony orchestra and supplemental readings. Open to Non Majors.

33, 133. CHAMBER MUSIC

A study of music for chamber ensembles, beginning with the early 17th century. Analysis of typical works in various media from different periods, with emphasis upon 18th and 19th centuries. Open to Non Majors.

134. PERFORMANCE PRACTICE PROBLEMS SINCE 1600

Styles of solo and ensemble performance of instrumental and vocal music from Baroque to the present. Changing aspects of medium, tempo, dynamics, phrasing, ornamentation, improvisation, temperament, etc. Applied to problems of musical interpretation.

135. MUSIC CRITICISM

Problems, principles, and procedures of descriptive and critical analysis and synthesis; relationship of language to description and criticism; experience in precise, expressive use of language.

36. ETHNIC MUSIC

A survey of the origins, growth and development of Folk music of the United States from the Colonies to the present. Non Majors.

37. HISTORY OF JAZZ I

A survey of the origins, growth and development of Jazz; its sociological importance and influence on composers of serious music. Non Majors.

38. HISTORY OF JAZZ II

Continuation of Jazz I. Non Majors.

39, 139. J. S. BACH

Life and works of Bach, with special emphasis on development of his musical style; detailed study of a selection of his chief works. Open to Non Majors.

40, 140. BEETHOVEN

Life and works of Beethoven, with emphasis on development of his musical style. Analysis of representative works. Open to Non Majors.

41, 141. BARTOK

Life and works of Bartok, with emphasis on development of his musical style. Open to Non Majors.

42, 142. STRAVINSKY

Stravinsky as a central figure of 20th century music; his musical styles and their sources. Open to Non Majors.

143. MUSIC SEMINAR

An exploration of the relationship of various philosophies of music with the actual writings of influential music critics over the centuries.

Theory and Composition

50. BASIC MUSICIANSHIP

For students who fail to qualify for Theory I. Listening techniques and basic principles of music. A student who fails this course may not major in music. Open to Non Majors.

51. THEORY I

Basic terminologies and problems of notation, melody, rhythm, harmony and their relationship to musical form. Lecture and drill in writing melodies, sight reading, ear training and analysis. Primary triadic harmonies. Lab required.

52. THEORY II

Continuation of Theory I. Secondary triadic harmonies; lecture and drill in sight singing, ear training, keyboard harmony, anaiysis and composition. Lab required.

53. THEORY III

Modulation and chromatic harmony. Lecture and drill in sight singing, ear training, keyboard harmony, analysis and composition. Lab required.

54. THEORY IV

Analysis of 20th century techniques; a study of serialism and its development.

155. ADVANCED KEYBOARD HARMONY AND MUSIC READING SKILLS

Intensive training in keyboard facility and sight singing. Application of material introduced in 28.051, 52, 53.

56. MODAL COUNTERPOINT

16th century. Analysis of contrapuntal procedures and representative compositions; writing of motets and masses. Emphasis on style of Palestrina.

157. TONAL COUNTERPOINT

18th century. Analysis of contrapuntal procedures and compositions; writing of inventions, chorale preludes, canons, and fugues. Emphasis on style of J. S. Bach.

158. ORCHESTRATION

Prerequisite: 28.051, 52, 53. Ranges, tonal possibilities, technical limitations, and necessary transpositions for all orchestral instruments.

159. ADVANCED ORCHESTRATION

Required for Theory and Composition majors. Practical orchestration in all its applications.

160. FORM AND ANALYSIS

Analysis of representative works of 18th century. Baroque and Classic.

161. FORM AND ANALYSIS

Analysis of representative works of 19th and 20th centuries.

162. COMPOSITION

Organization of musical ideas into logical and homogeneous form, with emphasis on traditional forms. Prerequisite: 28.051, 52, 53, 600.

163. ADVANCED COMPOSITION

Writing for various instrumental media, solo, and ensemble. Prerequisite: 28.620.

Techniques and Conducting

65. CHORAL CONDUCTING

Conducting patterns applied to elements of interpretation.

166. ADVANCED CHORAL CONDUCTING

Art of choral conducting: coordination of hand technique, breath control, sound control, articulation, dynamics, legato line, interpretation of music. Prerequisite: 28.065.

67. ORCHESTRAL CONDUCTING

Fundamentals of score reading and baton technique.

168. ADVANCED ORCHESTRAL CONDUCTING

Further development of score reading and conducting technique. Prerequisite: 28.067.

69, 169. VOCAL PEDAGOGY

For teachers of voice, choral directors, and voice students. Processes in voice production: respiration, phonation, articulation, resonation. Voice classification, quality, diction registration, breath support, breath control.

170. DIRECTED STUDY

Personal research in an area of music history, aesthetics or applied music not covered in the course offerings. By permission of the chairman only.

COLLEGE OF HUMANITIES
DEPARTMENT OF PHILOSOPHY

Timothy P. Fallon, S.J., Ph.D., *Chairman*

Professor: Austin J. Fagothey, S.J.
Associate Professor: James W. Felt, S.J.
Assistant Professors: Donald A. DePaoli, S.J., Milton Gonsalves, S.J., William O. Kerr, Jr., Leonard S. Lyons, Peter B. Manchester, Myra M. Milburn, William A. Parent
Acting Assistant Professor: Joseph C. Burgess

In the College of Humanities, the University of Santa Clara offers a four-year undergraduate program leading to the Bachelor of Arts degree with philosophy as the major emphasis.

Students making philosophy their major, besides fulfilling the general requirements of the University and the College of Humanities, have the following departmental requirements to complete:

At least four lower division courses in Philosophy, including 8 and 9.

At least eight upper division courses in Philosophy.

An overall C average must be maintained in these courses.

Each philosophy major will be assigned an Academic Advisor from among the Department's staff at the time he declares his major. Thereafter, he is free to change his advisor as he becomes better acquainted with the Department.

With his Advisor, he prepares a program of study oriented to his own interests in both philosophy and the other disciplines represented in the University. The student majoring in Philosophy ordinarily has ten non-philosophy electives in the upper division and he is expected to make choices for those courses which are coherent with his philosophical interests and career plans. Specific Departmental requirements are flexible and include only the following general guidelines:

History of Philosophy: 8 and 9 are required and 10 strongly recommended.

Logic: At least one course, selected from among 3, 109, or (with Advisor's recommendation) Mathematics 32.

Ethics: At least one course, chosen from among 103, or (with Advisor's recommendation) other upper division courses which treat ethical topics.

Metaphysics: At least one course, chosen from among 102, or recommended upper division elective.

No senior thesis is required, however the Department strongly urges that majors who plan to do graduate work in Philosophy take 198.

All courses offered by the Department are available for satisfying University and College requirements, except that as a general prerequisite two lower division courses must be taken before enrolling in any upper division course.

Philosophy credits granted for Fine Arts 178 and 179.

Lower Division

3. LOGIC

Introduction to logic. Discussion of the nature and structure of arguments, and introduction to the criteria for their evaluation. Exploration of some philosophical problems of logic.

4. INTRODUCTION TO PHILOSOPHY

An introduction to philosophy through a consideration of the problems raised in at least three major areas in philosophy: ethics, metaphysics, and epistemology. Recommended as a beginning course in philosophy.

5. VALUES AND CONDUCT

A more in-depth study of the problems in ethics; an exploration of current ethical questions, with attention to concepts of value, virtue, obligation and responsibility.

6. BEING AND KNOWING

A further investigation of the principal problems encountered in asking what it means to be (metaphysics) and what it means to know (epistemology).

8. ANCIENT PHILOSOPHY

The beginnings of Western philosophy from the pre-Socratics through Augustine. Studies in representative writers of the Greek and Greco-Roman traditions, with attention to their historical relationships to one another and to contemporary thought. Recommended as a beginning course in philosophy.

9. MEDIEVAL AND RENAISSANCE PHILOSOPHY

Philosophy from the collapse of the Roman Empire to the 17th century. The growth, flourishing, and decline of medieval thought, and its supplanting by Renaissance attitudes. Reading and discussion of representative works.

10. EARLY MODERN PHILOSOPHY

Philosophy during the 17th and 18th centuries, the late Renaissance and the Enlightenment. Problems include the scope and value of human knowledge, methods of inquiry, and the nature of the mind.

20. ORIENTAL PHILOSOPHY I

A general introduction to philosophies and cultures of the East, especially of India, China, and Japan. Emphasis on the concepts and values which permeate the ways of thinking and living of Eastern peoples.

21. ORIENTAL PHILOSOPHY II

Continuation of Oriental Philosophy I.

Upper Division

Systematic Courses

100. MODERN AND CONTEMPORARY PHILOSOPHY

Philosophy in the 19th century with an introduction to contemporary schools of thought. Discussion of the concepts of history, society and political order, and of the nature of individuality.

102. METAPHYSICS

Introduction to the classical problems and historically important contributions in formal theory of being, with attention to unresolved disputes, and often with focus on particular traditions such as Thomism, German Idealism, etc.

103. ETHICAL THEORY

An examination of the possibility and nature of ethical knowledge as found in various philosophical approaches to the moral life, and application of these concepts to current moral problems.

104. EPISTEMOLOGY

Formal study in depth of the conditions of knowledge, with emphasis on the concepts of "cognition" and "truth."

109. DEDUCTIVE LOGIC

Examination of some formal symbolic systems of deductive logic. Prerequisite: Phil. 3 or permission.

110. INDUCTIVE LOGIC

An introduction to the principles of inductive logic with special attention to the problem of confirming scientific hypotheses. Prerequisite: 3 or 109.

112. PHILOSOPHIES OF HISTORY

A philosophical study and critical analysis of diverse explanations of history in terms of rational patterns. Methodology of history and categories of historical explanation.

117. PHILOSOPHY AND LANGUAGE

An introduction to philosophical considerations concerning the nature of language and meaning. Either historical, systematic, problematic, or linguistic approaches will be emphasized. Prerequisite: Instructor's permission.

123. PHILOSOPHY AND PHYSICAL SCIENCE

Philosophical considerations involved in the presuppositions and methods of physical science. Prerequisite: Either two courses in natural science, or one course with a laboratory.

124. PHILOSOPHY AND SOCIAL SCIENCE

Consideration of the philosophical implications and ramifications of the findings of the social sciences. Special attention given to the philosophical pertinence of the data supplied by psychology, sociology, and political science.

136. PHILOSOPHY OF LAW

The sources and purposes of positive law, its foundations and derivations, and its relation to ethics and society.

138. POLITICAL PHILOSOPHY

A critical examination of modern political theories and of the problems of political society, such as individualism in its tension with the public good, etc.

141. PHILOSOPHY OF RELIGION

Introduction to the critical study of the conceptual aspects of religious thought, including such topics as: the phenomenon of religion, agnosticism and mysticism, theories of immortality, evil, and the creative process.

142. METHODS I

A reflection on the way the human mind operates whenever it is occupied, in order to determine the most general features of the knowledge process as it is employed in any field of knowledge.

Philosophical Movements

156. MEDIEVAL PHILOSOPHERS

Reading and interpretation of selected texts of medieval philosophers, with special attention to the writings of St. Thomas Aquinas. Attempts to disengage what is relevant and irrelevant to our age.

160. RATIONALISM AND EMPIRICISM

The rationalism of Descartes, Spinoza, and Leibniz, as contrasted with the empiricism of Locke, Berkeley, and Hume. An intensive study of some of these philosophers' writings.

165. AMERICAN PHILOSOPHY

Reading, interpretation, and discussion of selected major works of major American thinkers. Critical evaluation. Their influence on American culture.

167. ANALYTIC PHILOSOPHY

Introduction to the major themes, methods, and historical origins of analytic philosophy. Examination and assessment of some of the writings of the logical positivists, Russell, Moore, Wittgenstein, and contemporary analytic philosophy.

169. PHILOSOPHY OF COMMUNISM

Critical analysis of the philosophical tenets of Marxism and subsequent Communist theory. Dialectical materialism.

171. EXISTENTIALISM

Reading and analysis of some of the major writings in Existentialism.

172. PHENOMENOLOGY

Comprehensive historical introduction to the phenomenological movement in Europe after Husserl, and detailed introduction to phenomenological method and its importance in the natural and social sciences.

179. CONTEMPORARY PROBLEMS

Analysis of problems arising from outstanding contemporary writings, selected by the instructor. Readings and discussions.

Philosophers in Depth

181. PLATO AND ARISTOTLE

Reading, interpretation, and discussion of some of the major writings of these two authors. Critical evaluation in the context of the relation of one another and to subsequent Western thought.

183. AUGUSTINE

A study of the relation between body and soul, philosophy and religion according to the works of Augustine.

185. KANT

Reading, analysis, discussion of some of the major works of Kant and his immediate successors.

186. HEGEL

Reading, analysis, discussion of some of the major works of Hegel and his immediate successors.

187. WHITEHEAD

Reading and analysis of the main philosophic writings of Alfred North Whitehead, with a view toward an understanding of process philosophy and its contemporary influence.

189. HEIDEGGER

Reading and analysis of the argument in *Being and Time* with an introduction to the later work: toward a critical appreciation of Heidegger's ontology and its influence.

195. WITTGENSTEIN

Exposition and analysis of the major themes in Wittgenstein's *Tractatus Logico-Philosophicus* and *Philosophical Investigations*. Prerequisite: 3 or 109.

198. SENIOR THESIS

199. DIRECTED STUDY

COLLEGE OF HUMANITIES
DEPARTMENT OF RELIGIOUS STUDIES

Acting Chairman: Joseph A. Grassi

Professor: Theodore Mackin, S.J.
Associate Professor: Joseph A. Grassi
Assistant Professors: Daniel O. Dugan, Kenneth D. Eberhard, Peter Manchester, Roger D. McAuliffe, S.J., Stuart D. McLean, James E. Sweeters
Lecturers: Daniel V. Germann, S.J., Edward D. McShane, S.J., Tennant C. Wright, S.J.

General Requirements

All undergraduate students entering the University in the first year are required to complete three courses in the Department of Religious Studies, at least one of which must be completed after the sophomore year (or during one of the two final years). Students entering the University in the second year must complete two courses, and one of these during the final two years; those entering in the third or fourth year, one course in either year.

Two kinds of sequences of courses may be chosen, although neither is obligatory. One sequence answers to the needs of students wishing a continued education in Roman Catholic theology; the other is a denominationally neutral sequence—with the two overlapping at many points. If the student chooses one of these sequences, he is urged to seek the advice of the Religious Studies faculty about which three courses are more suitable for him.

Roman Catholic Sequence

1. Introduction to Religious Studies
2. Introduction to the Old Testament
3. Introduction to the New Testament
4. Introduction to Christian Theology
6. Christian Origins
10. Religious Symbol and Myth
20. Christian Perspectives of Man
21. The Christ of Faith
30. The Theology of Christian Community
40. Faith and Reason
60. Christian Ethics
70. The History of Christianity, Part I
71. The History of Christianity, Part II
80. Christian Liturgy
121. Trinitarian Theology
122. The Person of Christ in the New Testament
130. The Theology of Hope
133. The Theology of the Sacraments
134. The Theology of the Eucharist
145. Modern Christian Social Morality
149. The Theology of Marriage
173. Questions in Contemporary Catholic Theology
179. The Theology of Karl Rahner

Neutral Sequence

1. Introduction to Religious Studies
2. Introduction to the Old Testament
3. Introduction to the New Testament
4. Introduction to Christian Theology
6. Christian Origins
10. Religious Symbol and Myth
20. Christian Perspectives of Man
21. The Christ of Faith
30. The Theology of Christian Community
40. Faith and Reason
60. Christian Ethics
70. The History of Christianity, Part I
71. The History of Christianity, Part II
121. Trinitarian Theology
122. The Person of Christ in the New Testament
130. The Theology of Hope
144. The Psychology of Religion
145. Modern Christian Social Morality
148. A Theology of Alienation
154. Existential Theology
157. God in Contemporary Thought
160. The Sociology of Religion
162. Theology and Social Change
163. Theology and Politics
166. The Theology of Non-Violence
180. Theological Esthetics
183. Art and Ritual
189. The Religions of Mexico

Note that these sequences do not list all the courses offered by the department. Unless otherwise specified other courses belong to the neutral sequence.

The Major in Religious Studies

Students may earn the Bachelor of Arts degree with Religious Studies as the major subject. Within Religious Studies three areas of concentration are available: the Scriptures, Theology, and Religion and Society. The student is not obligated to do so, but if he wishes to concentrate his study, he may elect one of these areas and, in consultation with his academic advisor, choose his courses in such a way as to develop the area of study coherently.

General Education

In addition to the requirements in general education for all students in the College of Humanities, the following are specific for students completing the major in Religious Studies:

Philosophy: three courses.

English: by the end of his first year in the University the student must, in order to demonstrate his competence in written expression, present to his advisor an essay which the latter judges satisfactory for this purpose. This may be an essay written for ordinary course work.

Foreign Language: by the end of the fall term of senior year the student must complete a reading proficiency test, administered by the Department of Religious Studies, in one classical or modern language.

History: two courses. These may be either the two-course sequence in the History of Christianity or the two-course sequence in History of Western Civilization. The latter is preferred.

Fine Arts: two courses selected from among those offered by the departments of Fine Arts, Music and Theatre Arts.

Requirements in Religious Studies

In consultation with his academic advisor the student is to select the four from among the following lower division courses that best supplement his earlier instruction and open, as well, into his area of interest in Religious Studies:

1. Introduction to Religious Studies
2. Introduction to the Old Testament
3. Introduction to the New Testament
4. Introduction to Christian Theology
6. Christian Origins
10. Religious Symbol and Myth
20. Christian Anthropology
21. The Christ of Faith
25. Religion and Culture
30. The Theology of Christian Community
40. Faith and Reason
50. World Religions
60. Christian Ethics
70. The History of Christianity, Part I
71. The History of Christianity, Part II
80. Christian Liturgy

Again in consultation with his academic advisor the student is to choose from among the upper-division courses in Religious Studies eight which will develop coherently his area of concentration. Or if he has not elected an area of concentration, he is to choose eight courses which, in the judgment of his advisor, will produce a balanced learning experience in Religious Studies.

In either case the eight courses are to include Directed Reading and Research (RS 198). Ordinarily the advisor supervises the latter course, although the student is free to request any of the Religious Studies faculty to do so. The courses may be completed in either junior or senior year.

1. INTRODUCTION TO RELIGIOUS STUDIES

An attempt to discover and evaluate the essential elements of the universal phenomenon of religion, especially in the light of contemporary man's understanding of himself and his world. Existential questions of wonder, love, death, freedom; religion in a world of evolution and revolution.

2. INTRODUCTION TO THE OLD TESTAMENT

A survey of the history of the people of Israel from the exodus through the post-exilic period to the Christian era, with particular attention on the formation of the Old Testament literature and on the developing form and content of the people's religious belief.

3. INTRODUCTION TO THE NEW TESTAMENT

A study of the formation of the New Testament literature in the first generations of the Christian community; in interpretation of the literary forms used by the community; an examination of the form and principal content of the primitive belief and worship.

4. INTRODUCTION TO CHRISTIAN THEOLOGY

The nature of theological reflection, studied by means of an examination of fundamental Christian images: God, man, the world, and Jesus Christ in contemporary thought.

6. CHRISTIAN ORIGINS

A study of the environment in which Christianity began: Judaism in the time of Jesus (Qumran community, Pharisees, Zealots, Sadducees, ordinary people); the Hellenistic and Roman religions. The earthly ministry of Jesus. The transition from Kingdom to Church. The emergence of Christianity from Judaism.

10. RELIGIOUS SYMBOL AND MYTH

An introduction to the major contemporary interpretations of the place of mythic and symbolic discourse in religious expression. Perspectives include the history of religions, the phenomenology of religion, and the psychology of the unconscious.

20. CHRISTIAN PERSPECTIVES OF MAN

The specific relationship of the teaching of the bible and Christian tradition on such matters as the origin of mankind, the human condition, the destiny of mankind and its attainment.

21. THE CHRIST OF FAITH

Selective theological interpretations of Jesus Christ, from Biblical literature, the history of Christian doctrine, and modern theological scholarship. The humanity and divinity of Jesus.

28. PSYCHOSYNTHESIS AND RELIGION

An inclusive and positive conception of man as a dynamic being in the process of personal growth within an evolving universe. It helps man to bring together all the parts of himself around a unifying center of being and awareness, the Transpersonal Self. It provides each individual techniques and ways to reach this higher self and bring it to bear in each existential situation.

30. THE THEOLOGY OF CHRISTIAN COMMUNITY

A study of the development of religious community, especially in the Jewish-Christian tradition; an analysis of the most recent Christian interpretations of the Church.

40. FAITH AND REASON

The course is an *apologia*, a rational account of the Christian commitment. It is partly historical, including a survey of apologetical literature from New Testament times. But in greater part it is a systematic analysis of the Christian commitment both as a faith statement and as membership in a community.

45. COMPARATIVE RELIGIOUS PHILOSOPHIES

A selective study of distinct religious visions of the sacred and the profane by means of literature in which these visions have been brought to philosophical expression. Images and concepts of the sacred and profane are studied, correlated, and unified. Attention is given to African, Indian, Jewish, and Christian religious philosophies.

48. A THEOLOGY OF ALIENATION

An analysis of the phenomenon of alienation and of its religious implications. The course examines alienation from self, society, God, and from the Church, and relates this experience to the basic Christian message.

50. WORLD RELIGIONS

An examination of the basic ideas of the most populated and influential world religions. An attempt is made to compare and sometimes contrast the ideas of these religions with those of Christianity. The religions studied are Hinduism, Zen, Confucianism, Taoism, Islam and Judaism.

57. TWENTIETH CENTURY CHRISTIAN PROPHETS

A study of the teaching of great Christian spokesmen of this century and of the effect of this teaching and of their conduct on society. Among those studied are the following: Reinhold Niebuhr, Dietrich Bonhoeffer, Paul Tillich, Pope John XXIII, Karl Rahner, Martin Luther King, Jr., Hans Küng and Daniel Berrigan. The course is ecumenical in scope and content.

60. CHRISTIAN ETHICS

A study of the dynamics of Christian conduct and of the moral implications of the Christian commitment. The formulation of the principles of a Christian ethic; their application to selected areas of moral conduct in contemporary life, e.g. to wealth and poverty, violence and non-violence, war and peace, inter-personal relations.

70. THE HISTORY OF CHRISTIANITY, Part I

A study of the history of the Church from the first community at Jerusalem until the eve of the Protestant reformation. The ruling perspective is that of developing theology and changing religious expression, but these set in their cultural and political contexts.

71. THE HISTORY OF CHRISTIANITY, Part II

A continuation of Religious Studies 70, beginning with the Protestant reformation and continuing until the present. Again the perspective is that of developing theology and changing religious expression.

80. CHRISTIAN LITURGY

The course leads the students into a living appreciation of the structure and rhythm of liturgical worship and of its function as celebration in Christian life. The appreciation is developed through the students' creating, as well as critically analyzing, various forms of Christian liturgy.

101. OLD TESTAMENT: THE PROPHETS

A study of the Former Prophets and the Latter Prophets according to the Hebrew tradition. An analysis of the meaning of prophet in the religious community, Israel.

102. OLD TESTAMENT: THE WRITINGS

A study of those books making up the Writings of the Hebrew tradition, as well as the added books of the deutero-canonical Wisdom Literature of the Septuagint. Selected readings in the inter-testamental writings and an inquiry into their influence on early Christianity.

106. THE SYNOPTIC GOSPELS

A study of the Synoptic Gospels, of the history of their formation, of their literary forms. An analysis of Salvation History as contained in these sources.

107. THE THEOLOGY OF ST. PAUL

A study of the formation of the New Testament books attributed to Pauline authorship, of their vocabulary, imagery and religious concepts. An analysis of the Pauline theology.

108. THE THEOLOGY OF ST. JOHN

A study of the formation of the fourth Gospel, of the Johannine letters and of the Apocalypse (Book of Revelations); of their vocabulary, imagery and theological concerns.

117. BIBLICAL GREEK, Part I

A study of the grammar, syntax and vocabulary of the *koine* Greek of the New Testament. Selected readings from the gospels and epistles.

118. BIBLICAL GREEK, Part II

A continuation of Religious Studies 117. Enrollment reserved for students who have completed that course or its equivalent.

121. TRINITARIAN THEOLOGY

A systematic study of the origins and historical development of Christian belief in a divine Trinity. Careful attention is given to the interaction between meditation on Scripture and philosophical reflection, culminating in thorough critical exploration of the trinitarian systems of the Fathers of the Church, especially of St. Augustine.

122. THE PERSON OF CHRIST IN THE NEW TESTAMENT

A systematic study of the origins in Scripture of Christian belief in the person and natures of Jesus, and of his work in redeeming.

130. THE THEOLOGY OF HOPE

A study of the dimension of promise-and-fulfillment inherent in Christian living and dying in anticipation of the arrival of God's kingdom. The existential tension between Christian possibility and Christian act.

133. THE THEOLOGY OF THE SACRAMENTS

A study of general sacramental theory; of the relationship of the Christian community to sacramental action; of the development of the cultural forms of sacramental action (except for that of the Eucharist).

134. THE THEOLOGY OF THE EUCHARIST

(A companion of the preceding course). A study of the nature of liturgical action, specifically of the meaning and historical development of the Eucharist. Comparative liturgies of East and West, and among the Christian churches of the West. The principles of continual liturgical development.

142. CHRISTIAN MYSTICISM

A study of selected writers in the contemplative and mystical traditions of Western mysticism.

143. CONTEMPLATION IN THE EASTERN AND WESTERN TRADITIONS

A study of selected writings from the contemplative non-Christian traditions of the East; a comparison of their thought and experiences with those of the contemplative and mystical traditions of Western Christianity.

144. THE PSYCHOLOGY OF RELIGION

A study of the phenomenon of religion as expressed in the various religious literatures, using both the psychological reflection on religion and the methods of analysis by psychologists, classical and contemporary.

145. MODERN CHRISTIAN SOCIAL MORALITY

A study of the principal social problems of contemporary history and of the suggested solutions to these problems in the documents of the Church. The course examines the relationship between religion and capitalism, poverty, racism, the various forms of government in so far as they make possible the life of a Christian; of private ownership, of labor unions. A study of John XXIII's encyclical, *Pacem in Terris*, is central to the course.

146. CHRISTIAN MEDICAL ETHICS

A study of Christian principles and their application to the ethical problems of modern medicine. Specific issues will include abortion, organ transplants, professional secrecy, human experimentation, eugenics, medicine and poverty, and care for the dying.

147. QUESTIONS IN CONTEMPORARY PROTESTANT ETHICS

A study of a selection of contemporary Protestant theologians as their thought relates to such problems as the new sexual morality, the humanization of cities, political morality, and the style of life; special consideration of the thought of Tillich, Barth, H. R. Niebuhr, Cox and Ramsey.

149. THE THEOLOGY OF MARRIAGE

A study of marriage Christianly understood from the Scriptures and from recent Catholic writing, and from a humane psychology of the human person. A survey of Roman Catholic Canon Law on marriage.

152. THE FOUNDATIONS OF MODERN THEOLOGY

A study of the philosophical and theological thought which has most influenced present-day theology. Authors studied will include Schleiermacher, Kierkegaard, Newman, Blondel and Heidegger.

153. PROCESS THEOLOGY

An examination of the philosophical and theological literatures comprising "process thought". The aim is to identify, develop, understand, and criticize the works of process thinkers, those who recommend process and evolutionary vocabularies for interpreting religious apprehensions of God, man, and the world in a way compatible with contemporary science. Some authors studied: Whitehead, Teilhard de Chardin, Bergson, Hartshorne, Ogden, Dunne, Cobb.

154. EXISTENTIAL THEOLOGY

A study of the influence of existentialist thinkers from the time of Kierkegaard on current religious thought. The various developments of the existentialist dimension in the writings of Reinhold Niebuhr, Tillich, Bultmann, Rahner and other scholars.

157. GOD IN CONTEMPORARY THOUGHT

A study of the question of God's existence and nature in the writings of contemporary thinkers, with special attention to neo-orthodox, existentialist and radical theologians of all persuasions.

160. THE SOCIOLOGY OF RELIGION

A study of religious phenomena and the function of religion in society using the analytic tools of the social sciences. Contributions of classical figures, e.g. Max Weber, Emile Durkheim and Malinowski; principal focus on contemporary theory and empirical studies of religion.

162. THEOLOGY AND SOCIAL CHANGE

A study of three or four theological perspectives as each comes to terms with a selected problem of social change, e.g. race, technology, the third world, the university, violence, non-violence. Theological emphasis on questions of Christian humanism, theology of history and theories of social change.

163. THEOLOGY AND POLITICS

A study of the alternative ways to make explicit the relationship of theology and politics. Principal theologians studied: Reinhold Niebuhr, H. Richard Niebuhr, Jacques Maritain, Paul Tillich, John Courtney Murray, Paul Ramsey, Johannes Metz, Harvey Cox and Juergen Moltmann. Concentrated treatment of one or two problems as illustrative. Guest lecturers from related disciplines.

166. THE THEOLOGY OF NON-VIOLENCE

An investigation of non-violence not only as an instrument of social change, but as a way of life in its character of by-product of the Christian commitment. The course examines civil disobedience, demonstrations, draft resistance and other forms of conscientious protest against social evils of the times. Non-violence is studied in its historical perspective beginning with Laotze and Soacrates, and continuing through the Christian tradition with Tolstoy, Thoreau, Gandhi, Martin Luther King and the Berrigans.

167. FREEDOM AS A THEOLOGICAL PROBLEM

A study of the motif of freedom in Christian thought past and present: in Pauline literature, doctrinal disputes in which freedom is a central issue (e.g. divine foreknowledge, original sin and grace) and contemporary theology—including political theologies or theologies of liberation.

171. THE RELIGION OF CONTEMPORARY JUDAISM

A study of Judaism in the twentieth century in terms of its principal cultural and social influences, its religious forms and theological teaching.

173. QUESTIONS IN CONTEMPORARY CATHOLIC THEOLOGY

A study of selected theological problems in the writings of contemporary Catholic thinkers.

174. QUESTIONS IN CONTEMPORARY PROTESTANT THEOLOGY

A study of selected theological problems in the writings of contemporary Protestant thinkers.

178. THE THEOLOGY OF PAUL TILLICH

A study of Tillich's *Systematic Theology*. Topics examined in detail include his method of correlation, revelation, the doctrine of God, Christology, original sin, and the doctrine of the Holy Spirit.

179. THE THEOLOGY OF KARL RAHNER

A reinterpretation of Catholic theology according to the writings of Karl Rahner. Special emphasis is placed on Rahner's basic philosophical method, its historical roots, and its application to his more recent theological writings.

183. ART AND RITUAL

An examination of the two modalities of symbolization—art and ritual—with a view to determining the precise differences between them, and the use one modality makes of the other. The history of the balance and the tensions between the two forms is traced in lectures. Criticism of theatrical pieces and of liturgies forms the basis of discussions. The construction of a liturgy or of an architectural project is the individual contribution of the student.

189. THE RELIGIONS OF MEXICO

A study of the nature of religion, with the data drawn mainly from the Pre-Columbian and the more modern religions of Mexico. The course includes a comparative study of the students' own religious modes and those of the various Mexican peoples.

190. SPECIAL QUESTIONS IN RELIGIOUS STUDIES

198. DIRECTED READING AND RESEARCH IN RELIGIOUS STUDIES

199. COLLOQUIUM IN RELIGIOUS STUDIES

COLLEGE OF HUMANITIES
DEPARTMENT OF THEATRE ARTS

William R. James, Ph.D., *Chairman*

Associate Professor: William R. James
Assistant Professors: Marcia M. Frederick, Stephen C. Schultz, Robert F. Shea
Lecturer: Albert L. Gibson
Theatre Technician: Ronald Skolmen
Artists-in-Residence: Charles Lampkin, Diana Morgen Welch

The Curricular Programs

The Department of Theatre Arts offers two distinct programs leading to the degree of Bachelor of Arts, and cooperates with the Department of Education in providing a teaching major and minor designed to meet the requirements for the State of California General Secondary Teaching Credential in Drama.

Theatre Art Program. Freshmen who elect the Theatre Art option normally must complete sixteen courses in the Department with an average grade of C or better. Four of these are the once-a-week Theatre Laboratory courses. Transfer students begin the Theatre Laboratory series at their grade level. The twelve remaining courses normally must include 10; 20; two courses from 30, 31, 32; 150; 170; two courses from the dramatic literature series 110 through 119; and one course from 131, 133, 135, 151, 152.

Students who expect endorsement from the Department for graduate training in acting, directing, or design, or for apprentice programs in the professional theatre, should take elective courses inside and outside of the Department in areas designed to increase specific skills. Actors are strongly advised to take appropriate courses in acting, music, voice, and dance. Designers and technicians are urged to take all courses in technical production, and related courses in other departments, such as, Basic Design, Basic Drawing, Survey of Art, and Visual Thinking.

All majors in Theatre Art are expected to participate in the production program of the Department. Course credit is given for accumulated production work at the discretion of the faculty.

Dramatic Literature Program. In cooperation with the Department of English, the Department of Theatre Arts offers a program in dramatic literature. This program is designed for students whose interests in theatre and drama are primarily academic, and for those who seek literary studies in drama and dramatic criticism. The requirements of the program are satisfied by taking twelve courses in English and Theatre Arts. In the lower division these courses are Theatre Arts 10 and 11, and English 25 and 28. Upper division students must take English 104; Theatre Arts 150 or 151; one course from English 116, 117, 118; one of the three-course sequences in dramatic literature (continental or English drama); and two electives from upper division courses in Theatre Arts.

Teaching Credential in Drama. The normal major in Theatre Arts fulfills the State requirements for a Teaching Major in Drama. The Teaching Major is expected to take the following courses from among the course options in the regular Theatre Arts program: 30, 32, 152.

Modern Ballet Program offers a major through the General Humanities Program (see p. 74) and a teaching minor recognized by the State of California. The Ballet Program produces classic and modern ballets with nationally known guest artists and liturgical dance as an integral part of the Mass sponsored by the Anna G. Gamble Foundation. Theatre Arts 40 is a prerequisite for all Ballet courses.

The State of California also recognizes a Teaching Minor in Drama. The normal requirements for the Teaching Minor in Drama at Santa Clara are Theatre Arts 10, 11, 30, 32, 150, 152.

The Theatre Production Programs

In conjunction with its curricular programs, the Department also produces a number of plays each year. This program includes a season of at least three faculty directed and designed plays on the main stage of the Lifeboat Theatre, and an unfixed number of faculty and student directed plays on the studio stage. The main stage productions often include the appearance of a professional guest artist. The studio plays are intended to supplement the main stage productions by providing a creative outlet for beginning actors, playwrights, and directors, and to provide an opportunity for experiment and innovation in theatre art.

The theatre production program also includes an unfixed number of dance programs each year in the Lifeboat Theatre or in the mission church.

1. FUNDAMENTALS OF SPEECH

A basic course in oral communication, stressing the practice of extemporaneous speaking. Content, organization, and delivery of informative and persuasive talks.

5. THEATRE LABORATORY

A sustaining course required of all freshmen majors in the Theatre Art Program. The entire full-time faculty and all majors in Theatre Art meet once a week for two hours. The course attempts to correlate all course work in the Theatre Art curriculum in a workshop situation. Credit given in the Spring term.

9. THEATRE APPRECIATION

Designed for the non-major. The course attempts to implant an understanding of and appreciation for the dramatic art. Theatre aesthetics. Dramatic art in contemporary society.

10. INTRODUCTION TO THEATRE ARTS

A basic study of theatre as a performing art. The functions and techniques of the theatre artist. Vocabulary of the theatre. Representative plays studied as pieces to be performed.

11. INTRODUCTION TO DRAMA

An elemental study of drama as a literary art form. The nature of drama and dramatic genre is explored from a social and historical perspective.

20. THEATRE GAMES

Improvisation. Analysis of skills and problems of individual students. Introduction to creative method. Sensitizing of physical and mental tools.

21. BASIC SKILLS FOR ACTORS

A series of four workshops taught by four different instructors. Workshops are: Mime (three weeks), Movement (three weeks), Fencing (two weeks), and Make-up (two weeks). Prerequisite: TA 20 or the equivalent.

26. BASIC DANCE TECHNIQUE

An introduction to the principles of expression in all modes of dance. Concentrates on fundamental technique and dance theory.

29. REHEARSAL AND PERFORMANCE

Course reserved for accumulated production credit by lower-division students. Permission of the faculty required.

30. BASIC STAGECRAFT

Principles and techniques of stagecraft. Stage nomenclature. Handling of scenery, power and hand tools. Modern production methods.

31. BASIC COSTUME CRAFTS

Principles and techniques of costuming for the theatre. Pattern making, cutting, sewing.

32. BASIC LIGHTING AND SOUND

Principles and practice of stage lighting and sound. Instrumentation. Methods of control. Elemental design theory and practice. Plotting, cueing, recording, principles of amplification.

40. ELEMENTARY MODERN BALLET I

Basic ballet barre work, center work in "dry" form, with simple adage and port de bras. Improvisation to all kinds of music. History, aesthetics, discussion, films.

41. ELEMENTARY MODERN BALLET II

Continuation of 40.

42. ELEMENTARY MODERN BALLET III

Continuation of 41, allegro with linking steps and movements. Improvisation to all types of music. History, aesthetics, discussion, films.

44. INTERMEDIATE MODERN BALLET I

Completion of barre work, simple combinations at barre and center. Improvisation to all types of music. History, aesthetics, discussion, films.

45. INTERMEDIATE MODERN BALLET II

Survey of history of dance from primitive man through ancient, medieval, Asiatic, and modern dance. Relation to other fine arts, to religion. Discussion of history and techniques with films.

55. THEATRE LABORATORY

A sustaining course required of all sophomore majors in Theatre Art. See TA 5 for description.

65. ORAL READING

Reading literature aloud. Development of vocal skills for communicating thought and feeling in literature.

70. THEATRE GRAPHICS

Introduction to graphic representation. Mechanical drawing, perspective, design and color, rendering for scenic design and costume design.

105. THEATRE LABORATORY

A sustaining course required of all junior majors in Theatre Art. See TA 5 for description.

111. CONTINENTAL DRAMA

A study of continental drama of the 17th, 18th, and early 19th centuries in translation. Emphasis on Neo-classicism and Romanticism.

112. MODERN DRAMA

A study of continental drama from Ibsen to the Theatre of the Absurd in translation. Emphasis on the avant-garde.

114. RESTORATION AND 18TH CENTURY DRAMA

A study of the drama in England from 1660 to the close of the 18th century.

115. ENGLISH DRAMA SINCE SHAW

A study of the drama in England from George Bernard Shaw to the present.

119. AMERICAN DRAMA*

A study of drama in the United States from 1787 to the present. Emphasis on the 20th century.

122. SCENE STUDY

A detailed study of creative method in role development. Considerable attention given to individual diagnosis and analysis.

124. ACTING FOR TELEVISION

A basic course in television acting for advanced actors. Studio orientation. Camera technique. Blocking, cueing, make-up.

129. REHEARSAL AND PERFORMANCE

Course reserved for accumulated production credit by upper-division students. Permission of the faculty required.

130. ADVANCED STAGECRAFT

Free form structures. Special materials. Welding and iron work. Techniques of property construction.

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*Refer to the Department of English section in this *Bulletin* for additional courses in Dramatic Literature.

131. STAGE LIGHTING

Advanced stage lighting design theory and practice. Optics. Color theory and aesthetics. Study of modern control systems. Prerequisite: 32.

133. SCENE DESIGN

Elements of scenic design. Perspective, rendering, drafting, model making. Styles of design. Scene painting and dressing the set. Prerequisites: 30, 70.

134. HISTORY OF COSTUME

History of costume in the Western world from ancient times to the present. Traditional and conventional stage costumes.

135. COSTUME DESIGN

Principles of costume design for the stage. Fabrics and special materials. Rendering. Style problems. Prerequisites: 31, 70, 134.

137. CHILDREN'S THEATRE AND CREATIVE DRAMATICS

A study of plays and production methods for young audiences. Story theatre. Dramatics as a stimulant to imagination and social growth.

139. TELEVISION PRODUCTION

An introductory course in television production designed to provide a base for advanced work. Studio nomenclature and equipment. Camera handling. Cutting and switching. Recording, audio, lighting, electronic effects.

140. INTERMEDIATE MODERN BALLET III

Continuation of 45, introduction to pointe work, development of more complex combinations at barre and center. Improvisation and individual projects. History, aesthetics, films.

142. ADVANCED MODERN BALLET I

Developed pointe work, more intricate combinations at barre and center. Improvisation and elementary choreographic expression. History, aesthetics, special films. Cinema-ballet.

143. ADVANCED MODERN BALLET II

Continuation of 142.

144. ADVANCED MODERN BALLET III

Continuation of 143, more finished creative expression. Methods for teaching children, supervised teaching. Thesis on dance. Discussions of history and aesthetics.

147. MODERN BALLET ENSEMBLE

Open to selected students for preparation and performance in modern and historical ballets. Credit available only after three terms of membership. May be repeated for credit.

150. PLAYSCRIPT INTERPRETATION

Analysis and interpretation of the playscript for the theatre artist. Structure, meaning, style, and tone investigated in a variety of dramatic forms.

151. PLAYWRITING

Critical analysis of dramatic structure and dramaturgic technique. Writing of original plays.

152. PLAY DIRECTING

Problems of play directing and skills required of play director. Projects in directing. Prerequisite: 150 or equivalent.

155. THEATRE LABORATORY

A sustaining course required of all senior majors in Theatre Art. See TA 5 for description.

160. THEATRE ADMINISTRATION

Functions and techniques of the Producer, Business Manager, Stage Manager, House Manager, and Box Office Manager. Building an audience. Control systems.

170. HISTORY OF THE THEATRE

A study of the physical theatre, production theory and practice, acting styles, and methods of staging from the ancient Greeks to the Romantic Movement.

172. THEORY AND PRACTICE IN MODERN THEATRE

A detailed study of selected theatre practitioners, their theories and techniques, from the early realists to the present.

180. CREATIVE PROJECTS

Projects in acting, directing, technical production, design, playwriting, stage management, or theatre administration initiated by the student. May be taken only by students who have exhausted course possibilities in chosen topic. Credit given by pre-arrangement with appropriate staff member. Permission of Departmental Chairman required.

190. INDEPENDENT STUDY

198. PRACTICUM

THE COLLEGE OF SCIENCES

John B. Drahmann, Ph.D., *Dean*

DEGREE PROGRAMS

Bachelor of Science

The College of Sciences offers major programs leading to the degree of Bachelor of Science in the areas of Biology, Chemistry, Mathematics, Physics, Economics, Political Science, Sociology, Psychology, and the Bachelor of Combined Sciences.

ACADEMIC INFORMATION

Freshmen and sophomores, except for Honors students and Advanced Placement students, are normally restricted to lower-division courses (numbered 1 to 99). Juniors and seniors are expected to take at least 12 upper-division courses (numbered 100 to 199).

Undergraduate work in the College of Sciences is measured in terms of number of completed courses. No credit is given for less than a full course and no special credit is given for laboratory work.

Credit by examination may be earned according to the rules specified in the section, "Academic Requirements and Regulations," except for courses involving laboratory work, seminar courses, or courses labeled NCX. Course descriptions indicate where laboratory work is required.

COLLEGE OF SCIENCES
DEPARTMENT OF BIOLOGY

Leo J. Hombach, S.J., M.S., *Chairman*

Professors: Francis R. Flaim, John S. Mooring
Associate Professors: Thomas N. Fast, Geraldine A. Tomlinson
Assistant Professor: Leo J. Hombach, S.J.
Acting Assistant Professor: William R. Eisinger

The biology curriculum reflects the great expansion of, and changes in, the life sciences. It seeks to prepare its graduates for any area of the life sciences by emphasizing principles and avoiding premature specialization. All students take a basic series of courses and then elect further courses. This program allows a solid foundation in the liberal arts with a clear understanding of the basic principles and subject matter of biology while deferring specialization until the senior year, when the student is in a better position to decide upon an area of concentration. The proficient graduate is then prepared to enter professional or graduate school, to find employment in nearly any area of the life sciences, or, with additional education courses, to teach biology in secondary schools.

Students who wish to make biology their major subject are required to fulfill the general requirements of the College of Sciences and complete the following for the Bachelor of Science degree:

1. Biology 30, 31, 32, 33, and 34; Chemistry 1, 2 and 35, 36.
2. Physics 4, 5, 6 or Physics 1 and 2.
3. Seven upper-division Biology courses which should be selected in consultation with the student's faculty advisor.
   a) Students will be required to complete at least one course from each of the following categories: Animal, Plant, Cell, and Population Biology. A single course may not satisfy the requirement in more than one category.
   b) All upper-division biology courses must be completed with at least a C average.
   c) Each candidate for a degree may be required to pass a comprehensive examination in the major. This examination may be oral, written, or both and will be scheduled within the last six weeks of the senior year.
4. Chemistry 10, and 37 are desirable for all and should be taken by those who plan professional studies in medicine, dentistry, or biology.
5. Although not a departmental requirement, students aspiring for graduate schools are strongly advised to study German and/or French.
6. Math 11, 12, and 13 (Calculus) are recommended to all prospective candidates to graduate or professional schools; Math 6 and 7 are satisfactory for other students.

Honors Program

An Honor student in Biology is eligible for Biology 195. He is also eligible to take Honors courses in other departments. In addition, if a student demonstrates competence in a particular field of biology, he may, with the Chairman's approval, carry out independent research in conjunction with regularly offered courses.

2. BASIC PRINCIPLES OF HUMAN BIOLOGY

A study of man's structure, function, reproduction, and development with emphasis on tissue and organ systems. Designed for Psychology and Sociology majors. Laboratory 30 hours. Spring term only.

7. ANATOMY

Detailed study of mammalian tissues and organ systems with introduction to embryology. Non-majors only. Laboratory 30 hours.

8. PHYSIOLOGY

Elementary vertebrate physiology. Functions of organs and organ systems. Non-majors only. Laboratory 30 hours. Prerequisite: Biology 2 or 7.

9. INTRODUCTION TO BIOLOGY

A course open to non-majors emphasizing the variety, diversity, and maintenance of animal organisms.

10. INTRODUCTION TO EVOLUTION**

An examination of the processes that have produced the diversity of living things. Non-majors only. Prerequisite: a high school or college biology course. Fall term only.

11. CELL BIOLOGY AND GENETICS

Same as 30 but without laboratory. For non-majors only.

30. CELLS AND HEREDITY

An introduction to cell biology including a descriptive study of plant and animal cells and their organelles as well as an examination of Mendelian genetics. Laboratory 30 hours. Fall term only.

31. BOTANY

A thorough survey of the plant kingdom combined with an introduction to plant morphology, anatomy, physiology, and development. Laboratory 30 hours. Prerequisite: Biology 30 and Chemistry 1. Winter term only.

32. ZOOLOGY

The animal kingdom, classification, embryology, anatomy and function of invertebrate and vertebrate organisms and organ systems. Laboratory 30 hours. Prerequisite: Biology 30 and Chemistry 2. Spring term only.

33. THE BIOLOGY OF POPULATIONS

A survey of the physical and biological factors that determine the distribution and abundance of organisms. Laboratory 30 hours. Prerequisites Biology 31, 32 or equivalent.

**Not offered in 1973-74.

34. CELL BIOCHEMISTRY AND PHYSIOLOGY

An introduction to the metabolic processes of cells, including the biochemistry of cell components. Anabolism and catabolism of carbohydrates, lipids, proteins and nucleic acids. Laboratory 30 hours. Prerequisites: Biology 30, Chemistry 35 and 36 (Chemistry 36 may be taken concurrently) *or* permission of instructor.

99. SPECIAL TOPICS

A more detailed investigation of a specific area or topic in the biological sciences. Open to non-majors as well as majors. Minimum laboratory: 20 hours.

101. VERTEBRATE ANATOMY

Comparative structure, organization, adaptation, classification. Laboratory 60 hours. Prerequisite: Biology 32, 34 or equivalent. Fall Term only.

102. VERTEBRATE EMBRYOLOGY

Gametogenesis, fertilization, patterns of development in the vertebrate, organogenesis. Laboratory 60 hours. Prerequisite: Biology 32, 34 or equivalent.

104. HISTORY OF BIOLOGY AND SEMINAR

Development of the science of biology, its doctrines and hypothesis. Guided reading in modern biology. NCX* Prerequisite: Biology 30, 31, 32, 33, 34 or equivalent.

107. HISTOLOGY AND CYTOLOGY

Protoplasm, cells, basic tissue types, structure and histogenesis. Basic histological techniques. Laboratory 60 hours. Prerequisite: Biology 32, 34 or equivalent. Winter Term only.

110. GENETICS

Basic principles governing inheritance in plants and animals. Laboratory 30 hours. Prerequisite: Biology 30, 34 or equivalent. Spring Term only.

111. CELLULAR PHYSIOLOGY

Physiological systems of plant and animal cells. Interaction at the molecular and cellular level. Enzyme kinetics. Laboratory 30 hours. Prerequisite: Biology 110, Chemistry 35.

112. PATHOGENIC MICROBIOLOGY

Examination of pathogenic microorganisms, diseases, diagnosis, immunological techniques. Laboratory 60 hours. Prerequisite: 113.

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* Exempted from challenge.

113. GENERAL MICROBIOLOGY

Characteristics of microorganisms: bacteria, fungi, viruses, rickettsiae. Indentification, isolation, morphology, physiology, bacterial genetics. Laboratory 50 hours. Prerequisites: Biology 30, Chemistry 35, or permission of instructor. Spring Term only.

115. DIFFERENTIATION AND DEVELOPMENT

Developmental phenomena as observed in cells and higher plants and animals with special emphasis on gene interaction in differentiation, morphogenesis, and growth. Laboratory 30 hours. Prerequisite: Biology 110 or equivalent. Winter Term only.

124. ANIMAL PHYSIOLOGY

A comparative study of organs and organ systems among vertebrates and invertebrates. Laboratory 60 hours. Prerequisite: Biology 32, 34 or equivalent. Spring Term only.

125. PLANT PHYSIOLOGY

An examination of the physiological processes of plants with an emphasis on current research in the field. Laboratory: 30 hours. Prerequisite: Biology 31, 34. Winter Term only; alternates with Biology 128.

128. PLANT DEVELOPMENT**

Study of plant development with emphasis on the experimental approach and current research. Laboratory 30 hours. Prerequisite: Biology 31, 115. Winter Term only; alternates with Biology 125.

130. ECONOMIC BOTANY

A critical analysis of plant food production potentials with special consideration of modern approaches to pest control. Prerequisite: Biology 31 or equivalent.

132. FIELD BOTANY

Field study of vascular plants, especially the seed plants of California; their identification, distribution, and ecology. Laboratory 60 hours. Prerequisite: Biology 31 or equivalent. Spring Term only.

156. GENERAL ECOLOGY**

Plant and animal populations, habitats, relationships, and adaptations. Laboratory and field work; community analysis, measurements of physical factors. Laboratory 30 hours. Spring Term only.

161. ENVIRONMENTAL AND POPULATION BIOLOGY**

An examination of ecological relationships and evolutionary processes. Laboratory and field trips 30 hours. Spring term only.

**Not offered 1973-74.

171. CHEMICAL BIOLOGY

Chemistry of biologically important compounds. Reactions and interactions of amino acids, proteins, carbohydrates, lipids, nucleic acids, hormones, vitamins and steroids. Buffers and pH. Energy relationships in biological systems. Prerequisite: Biology 34 and Chemistry 37 or permission of instructor.

173. EVOLUTION

The basic principles of organic evolution, with emphasis upon the Modern Synthetic Theory of Evolution. Prerequisite: Biology 110.

180. BIOENERGETICS**

Special topics including aspects of biological applications of physical chemistry and biophysics.

190. CONTEMPORARY ISSUES IN BIOLOGY

A specialized treatment of some aspect of biology which is of current interest to the biologist as well as to society in general. Prerequisites will be specified according to topic.

195. SPECIAL PROBLEMS

Supervised laboratory research culminating with a written report suitable for publication. Sustained for one year with credit given for one term. Prerequisite: Permission of the Department Chairman. NCX*

199. INDEPENDENT STUDY IN BIOLOGY

Detailed investigation of specific topics in biology under the close direction of a faculty member. Prerequisite: Permission of the Department Chairman. NCX*

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*Exempted from challenge.

**Not offered 1973-74.

COLLEGE OF SCIENCES
DEPARTMENT OF CHEMISTRY

William F. Sheehan, Ph.D., *Chairman*

Professors: Joseph F. Deck, William F. Sheehan
Associate Professors: Robert J. Pfeiffer, Michael A. Sweeney
Assistant Professor: Lawrence C. Nathan
Visiting Assistant Professor: Daniel T. Hefelfinger

The Department of Chemistry offers two baccalaureate degrees: (1) Bachelor of Science in Chemistry (Certified by the American Chemical Society), and (2) Bachelor of Science with a major in Chemistry.

Bachelor of Science in Chemistry (Certified)

This four-year curriculum provides graduates with the training necessary to enter work as chemists in various commercial and governmental laboratories or to transfer upon graduation to institutions offering advanced degrees in Chemistry. The American Chemical Society certifies that this degree meets all its recommended standards for the professional training of chemists. High School preparation should include algebra, geometry, trigonometry, physics, and chemistry.

Requirements for Bachelor of Sciences in Chemistry (Certified)

Requirements in Major. Chemistry 1, 3, 11, 35, 36, 37. Chemistry 101, 110, 151, 152, 153, 180, and three additional upper division chemistry courses. One upper-division course in Physics, Mathematics, or Biology may be substituted for an upper-division course in Chemistry not explicitly specified.

Required Supporting Courses. Physics 4, 5, and 6. Mathematics 11, 12, and 13. Recommended Supporting Course, Mathematics 21.

A grade-point average of 2.0 or more for all chemistry courses undertaken is required for admission to, or retention in, this program. A reading knowledge of German or Russian is ordinarily required, and the student must pass an examination in the language of choice administered by competent faculty.

HONORS PROGRAM

Students of superior ability who enroll for either chemistry degree may apply for admission to the Honors Program.

Bachelor of Science with a Major in Chemistry

This four-year program provides a liberal scientific degree with emphasis on the central science that lies between physics and biology. It offers chemical training for those planning to obtain work of a broad technical nature, either in scientific laboratories or in fields allied in chemistry. This program will suffice for careers in patent law, library work, teaching, or business or industries having chemical products. This program will adequately prepare the student for entrance into medical, dental or any other program dealing with the health, geological, agricultural, or materials sciences. High school preparation should include algebra, geometry, trigonometry, and chemistry.

Requirements for Bachelor of Science with a Major in Chemistry

Requirements in Major: Chemistry 1, 3, 11, 35, 36, 37, 110, 112, 151, 152. Besides Chemistry 110, 112, 151, and 152, a student must take five upper division natural science courses, of which three may be biology, mathematics or physics, all in the upper-division bracket. Students interested in the health sciences would select Biology as the science other than Chemistry. Chemistry 180 may replace 112. A grade-point average of 2.0 or more for all chemistry courses undertaken is required.

Required Supporting Courses: Physics 1, 2, or 4, 5, and 6. Mathematics 11, 12, and 13.

NB. The following pairs of courses are the same in content and scheduling except for laboratory work: 2 and 4, 31 and 35. Laboratory courses require a deposit for breakage and chemicals. See Student Expenses.

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1. GENERAL CHEMISTRY I

Atomic Structure. Periodic Properties and the Periodic Table. Nomenclature. Chemical Bonding. Molecular Geometry. Chemical Equations and Quantitative Relationships. Themochemistry. Properties of Gases, Liquids, and Solids. Solutions. Chemistry of Oxygen and Hydrogen. Equivalent Weights. Oxidation and Reduction. Quantitative determinations in the laboratory exercises. Laboratory 30 hours. Fall Term. Prerequisites: High School Chemistry, Physics, Algebra, Geometry, and Trigonometry.

2. GENERAL CHEMISTRY II

Chemical Kinetics. Equilibrium. Acids and Bases. Ionic Equilibria. Chemical Properties of Metals. Electrochemistry. Properties and Structures of non-metals, and their compounds. Systematic analysis of some cations and anions in the laboratory. Laboratory 30 hours. Prerequisite: CH I. Winter Term.

3. GENERAL CHEMISTRY (HONORS)

Electrochemistry. Non-Metals. Thermodynamics. Chemical Equilibrium. Chemical Kinetics. Acids and Bases. Metals. Industrial Chemistry. Systematic analysis of some cations and anions in the laboratory. Laboratory 60 hours. Prerequisite: CH I. Winter Term.

4. GENERAL CHEMISTRY II FOR ENGINEERS

Same as Chemistry 2 but without laboratory. Prerequisite: CH 1. Winter Term.

***5. CHEMISTRY FOR ENGINEERS I**

***6. CHEMISTRY FOR ENGINEERS II**

7. THE ART OF CHEMISTRY

Atomic and Molecular structure. Laws of chemical change. Kinetic Theory. Periodic Table. Chemical Reactions. The nucleus and nuclear reactions. For the non-science student. Laboratory 30 hours. Winter Term.

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*CH 5 and 6 dropped after September 1971.

8. CHEMISTRY IN EVERYDAY LIVING

Compounds of carbon. Food chemistry. Biochemical reactions. The role of Chemistry in modern life. Laboratory 30 hours. Prerequisite: High school Chemistry or CH 7. Spring Term.

10. QUANTITATIVE ANALYSIS FOR BIOLOGISTS

Theories and practice of acidimetry, alkalimetry, and volumetric precipitations. Introduction to gravimetric analysis. Introduction to theories of oxidimetry and reductimetry. Laboratory 40 hours. Prerequisite: CH 2. Spring Term.

11. QUANTITATIVE ANALYSIS FOR CHEMISTS

Theories and practice of acidimetry, alkalimetry and volumetric precipitations. Introduction to gravimetric analysis. Introduction to theories of oxidimetry and reductimetry. Laboratory work will also include elementary instrumentation. Laboratory 80 hours. Prerequisite: CH 2 or 3. Spring Term.

30. SURVEY OF ORGANIC CHEMISTRY

A survey of the more important classes of organic compounds with emphasis on materials of interest to the students of the biological sciences. Laboratory 30 hours. Intended for students not majoring in chemistry and not planning to take additional courses in organic chemistry. Prerequisite: CH 1 or 7. Spring Term.

31. ORGANIC CHEMISTRY I

Structure and bonding in organic compounds. Chemistry of aliphatic and aromatic hydrocarbons and their derivatives. Stereochemistry. Introduction to reaction mechanisms. No laboratory. Prerequisite: CH 2 or 3. Fall Term. NCX.

35. ORGANIC CHEMISTRY I

Structure and bonding in organic compounds. Chemistry of aliphatic and aromatic hydrocarbons. Stereochemistry. Introduction to reaction mechanisms. Laboratory 40 hours. Prerequisite: CH 2 or 3. Fall Term.

36. ORGANIC CHEMISTRY II

Properties and preparation of compounds containing a single functional group. Reaction mechanisms. Absorption spectra. Laboratory 40 hours. Prerequisite: CH 31 or 35. Winter Term.

37. ORGANIC CHEMISTRY III

Chemistry of polyfunctional compounds. Introduction to heterocyclic compounds, proteins, and carbohydrates. Polynuclear hydrocarbons. Laboratory 40 hours. Prerequisite: CH 36. Spring Term.

101. ADVANCED INORGANIC CHEMISTRY

Atomic structure. Periodic Law. Chemical bonding. Molecular geometry. Crystal Structure. Chemical properties of the elements. Symmetry and group theory.

Coordination chemistry. Synthetic inorganic chemistry. Laboratory 30 hours. Prerequisites: CH 11, 36 and 152. Spring Term.

110. INSTRUMENTAL METHODS IN ANALYSIS

Principles and use of instruments. Spectroscopic methods of analysis. Potentiometric, conductometric, and electroanalytical techniques. X-Ray Diffraction. Magnetic Susceptibilities. Thermoanalytical methods. Laboratory 60 hours. Prerequisites: CH 11, 37, 152. CH 101 is recommended. Winter Term.

112. ADVANCED QUANTITATIVE ANALYSIS

Oxidation-reduction equilibria and titrations. Complex ion titrations. Gas Chromatography, theory and practice. Mass Spectrometry, theory and workshop. Solid phase and surface chemistry. Gravimetric Analyses. Error and statistics. Prerequisites: CH 10 or 11. Laboratory 60 hours. Fall Term.

134. ADVANCED ORGANIC CHEMISTRY I

Synthesis and properties of five and six-membered rings with one heterocyclic atom. Brief introduction to other classes. Prerequisites: CH 37. Fall Term. NCX

135. ADVANCED ORGANIC CHEMISTRY II (PHYSICAL ORGANIC CHEMISTRY)

Molecular orbital treatment of organic compounds. Mechanisms of reactions. Reactive intermediates. Quantitative relationships involving structure and reactivity. Applications of absorption spectroscopy to organic compounds. Prerequisite: CH 37. Winter Term. NCX.

136. ADVANCED ORGANIC CHEMISTRY III

Synthesis and reactions of acetogenins, alkaloids, terpenes and steroids. Emphasis on reaction mechanisms and stereochemistry. Prerequisite: CH 37. Spring Term. NCX

140. BIOCHEMISTRY

Carbohydrates, lipids, proteins. Constituents of blood and urine. Enzymes. Colloidal state, digestion and biological oxidations. Prerequisite: CH 36. Winter Term. NCX.

150. SURVEY OF PHYSICAL CHEMISTRY

States of matter. Thermodynamics and Thermochemistry. Solutions. Chemical Equilibrium. Ionic Equilibrium. Electrochemistry. Chemical Kinetics. Absorption and Colloids. Radiochemistry. Intended for students majoring in the biological sciences. A term course in calculus is advisable. Prerequisite: CH 10, 31 or 35. Winter Term. NCX.

151. PHYSICAL CHEMISTRY I

Equations of state of pure fluids. Energy and enthalpy. Thermochemistry. Entropy. Free Energy. Chemical potential. Surface Energy. Phase Rule. Problems. Prerequisites: CH 10 or 11. Mathematics 11. Physics 2 or 6. Fall Term. NCX

152. PHYSICAL CHEMISTRY II

Colligative Properties. Chemical equilibrium. Chemical kinetics. Migration of charged species. Electrochemical cells. Crystals. Problems. Laboratory 60 hours. Prerequisite: CH 151. Winter term.

153. PHYSICAL CHEMISTRY III

Quantum mechanics. Particle in box. Harmonic oscillator. Hydrogen atom. Variation method. Virial theorem. Molecular structure and spectroscopy. Statistical mechanics. Reaction rate theory. Problems. Laboratory 60 hours. Prerequisite: CH 152, Math 013. Recommended prerequisite: Math 021. Spring Term.

154. ADVANCED PHYSICAL CHEMISTRY I

Wave phenomena and Equations describing them. Schrödinger Equation. Nuclear Chemistry. Radiochemistry. Prerequisite: CH 153. Spring Term. NCX

165. CHEMISTRY IN NORTH AMERICA

Historical and Scientific Methods. Place of North American Chemistry in world chemistry. Chemical arts of Aztecs, Pueblos, colonists. Development of tanning processes to poromerics. Growth of chemical industry in North America to present. Chemists of North America. Chemistry as a profession. Term paper required. NCX

180. UNDERGRADUATE RESEARCH

Individual research for senior chemistry majors under direction of faculty. Chemical and/or computer laboratory to be arranged. A written report suitable for publication and oral presentation of that report in seminar are required for credit. Seminar. Prerequisite: CH 153.

COLLEGE OF SCIENCES
BACHELOR OF COMBINED SCIENCES

Dr. Joseph F. Deck, *Director*
Professor of Chemistry

Aware that students now aspire for a real responsibility in getting a true and useful education, the College of Sciences offers its students a curriculum that emphasizes adaptability and freedom. This curriculum would challenge any student to make what he can of the full facilities and all the faculty of the College of Sciences. It incorporates features that respond to real student needs and desires and to the demands that the modern world makes on graduates. The completion of this curriculum will merit a Bachelor of Combined Science Degree (B.C.S.).

Some particular aims of the new program include: 1) appealing alternatives to regular departmental majors, 2) a liberal science degree for modern man in a modern scientific world, 3) an opportunity of keeping open for an unusually long period at Santa Clara the various options of the undeclared science major, 4) a non-specific scientific background for modern jobs that often require only a casual understanding of scientists and their limitations and background when there is little or no need for real scientific ability in the traditional sense, as in advising management, legislation, courts, governmental agencies on food and drugs and so on, 5) excellent preparation for the student contemplating the health sciences, such as medicine, dentistry, etc. who has no specific desire for completing programs in the conventional science programs now offered.

The program is so planned that a student would be qualified to take *upper division courses* offered by one or several departments of the College without necessarily establishing a regular departmental major. This scheme reinforces the student's early scientific interests as early as is consistent with reasonable loads, electives, and so on so that upper division work of the preferred kind of science can be started as early as year 3. Yet, by the end of the winter term of year 3, this plan opens the way to any upper division course in the College. This upper-division freedom is admired by students and faculty and distinguishes this plan from most others.

Requirements for Bachelor of Combined Sciences, B.C.S.

Required Courses in the Natural Sciences:

Chemistry 001, 002, 030 (or in place of 030 the 3-term course sequence in organic chemistry if needed), Mathematics 011, 012, and 013, statistics, Physics 004, 005, and 006, Biology 030, 032, 034.

Required Courses in the Social Sciences:

Economics 001, 002, Psychology 010, and 011, Sociology 001, 018, and 019, Political Science 001, 002.

Required Courses in the Humanities:

English (two terms), Religious Studies (three terms). Twelve (12) upper division courses are required for the degree, seven of which must be taken from the College of Sciences. To complete the program of 40 courses required for graduation, courses should be elected in the Humanities.

CURRICULUM FOR BACHELOR OF COMBINED SCIENCES DEGREE
NATURAL SCIENCES

Fall	Winter	Spring
Chemistry 001	Chemistry 002	Math 013
Economics 001	Economics 002	Religious Studies
English 001	English 002	Statistics
Math 011	Math 012	Physics 004
Biology 030	Religious Studies	Biology 032
Elective	Elective	Political Science 001
Sociology 001	Psychology 010	Psychology 011
Physics 005	Physics 006	Chemistry 030
Political Science 002	Biology 034	Religious Studies
Sociology 018	Sociology 019	Elective*
Elective*	Elective*	Elective*
Elective*	Elective*	Elective*
Elective*	Elective*	Elective*
Elective*	Elective*	Elective*

CURRICULUM FOR BACHELOR OF COMBINED SCIENCES DEGREE
SOCIAL SCIENCES

Fall	Winter	Spring
Chemistry 001	Chemistry 002	Math 001
Economics 001	Economics 002	Religious Studies
English 001	English 002	Statistics
Sociology 001	Psychology 010	Psychology 011
Political Science 001	Political Science 002	Religious Studies
Elective	Elective	Math 013
Math 011	Math 012	Physics 004
Sociology 018	Sociology 019	Chemistry 030
Biology 030	Biology 031	Religious Studies
Physics 005	Physics 006	Biology 032
Elective*	Elective*	Elective*
Elective*	Elective*	Elective*
Elective*	Elective*	Elective*
Elective*	Elective*	Elective*

* Seven of these 12-13 electives must be upper division courses in the College of Sciences.

COLLEGE OF SCIENCES
DEPARTMENT OF ECONOMICS

Mario L. Belotti, *Chairman*

Professors: Mario L. Belotti, Thaddeus J. Whalen, Jr.
Associate Professor: J. M. Heineke
Assistant Professors: Richard T. Coz, S.J., Henry Demmert, Daniel T. Dick, William Donnelly, S.J., Gebhard Long, Robert E. Looney, Marshall Medoff
Lecturer: J. Bohman

Students majoring in Economics in addition to fulfilling the general requirements for a Bachelor of Science degree, must complete the following departmental requirements:

Freshman and Sophomore years: Economics 1 and 2 (Principles of Economics), Economics 55 (Statistics—Quantitative Methods 40 can be substituted), Mathematics 11 and 12 (Analystical Geometry and Calculus I and II). A student may petition to substitute two other math courses for Math 11 and 12.

Junior and Senior years: Economics 110, 114, and 115. Six upper-division economics electives. (Students may petition to substitute one of the upper-division economics electives with another course.)

Honors Program

In collaboration with other departments of the Social Sciences Division, the Department of Economics offers to its best students an honors program consisting of special seminars and independent studies. Students will be admitted into the honors program only upon faculty recommendation.

Economics 1 and 2, or permission of the instructor, is required for all upper-division courses.

1. PRINCIPLES OF ECONOMICS I

An introduction to the general principles, terminology, and methods of macroeconomics.

2. PRINCIPLES OF ECONOMICS II

An introduction to the general principles, terminology, and methods of microeconomics.

12. AMERICAN ECONOMIC HISTORY

A study of the economic history of the United States with special emphasis upon basic economic organizations, such as the business enterprise, the labor union, and the economic functions of government.

15. ENVIRONMENTAL RESOURCES AND INDUSTRIES

This course examines the market solution to resource allocation and then explores market failure with reference to the use of common property environmental resources, air and water. Efficient use of these resources will be examined and mechanisms to arrive at the efficient solution will be analyzed. Prerequisite: Economics 2, or permission of instructor.

20. CURRENT ECONOMIC ISSUES

A study of contemporary economic problems.

55. STATISTICS I

Introduction to statistical methods and techniques of elementary statistical analysis.

101. STATISTICS II

A course designed to acquaint the student with the foundations of statistical research methods. Topics include distribution theory, estimation, testing, and prediction, with special emphasis upon multivariate models. Prerequisites: 22:011 and 22:012 or equivalent.

110. HISTORY OF ECONOMIC THOUGHT

A study of the evolution of economic ideas and their influence on the development of economic practices.

111. MATHEMATICAL ECONOMICS

The formulation of various economic systems in mathematical terms and the deduction of a number of properties of these systems. Prerequisites: Math 11 and 12, or permission of the instructor. Prerequisites: 22:011, 22:012, 13:114 and 13:115, or consent of professor.

112. ECONOMETRICS

The estimation and testing of fundamental economic relationships. Prerequisite: 101 or equivalent.

113. INDUSTRIAL ORGANIZATION

A microanalysis of the structure, conduct, and performance of American industry.

114. MICROECONOMICS I

The formulation and explanation of the theory of output, cost, and product prices and of the theory of the employment of, and returns to, the factors of production.

115. AGGREGATE ECONOMIC THEORY

An analysis of the level of national income and its determinants.

116. ECONOMIC DEVELOPMENT OF THE UNITED STATES

An analysis of the principal factors governing the growth and expansion of the American economy since 1800.

117. ECONOMIC DEVELOPMENT OF EUROPE

A study of the preindustrial environment and industrial growth patterns of the western European countries.

118. COMPARATIVE ECONOMIC SYSTEMS

A comparison of free market economies with other economies.

119. PUBLIC FINANCE

An analysis of public expenditures, public revenues, and public debt with particular emphasis upon their effects on the economy.

120. TAXATION

An analysis of the shifting, incidence, and economic effects of the various forms of taxation. Prerequisite: Economics 114.

121. MICROECONOMICS II

A study of the principles by which economists evaluate the social desirability of alternative market arrangements. Prerequisite: Economics 114.

122. MONEY AND BANKING

A theoretical, institutional, and historical approach to the study of money and banking, with particular emphasis upon the relationship between the monetary and banking system and the rest of the economy.

128. BUSINESS FLUCTUATIONS AND FORECASTING

A study of the nature and causes of economic instability in an industrial economy.

129. ECONOMIC DEVELOPMENT

An analysis of the historical and theoretical context underlying present efforts to increase the rate of economic growth in underdeveloped countries.

130. LATIN AMERICA ECONOMIC DEVELOPMENT

An examination of the economic development of Latin American countries with particular emphasis on the relationships between economic growth and the social, political and economic structures of these countries.

131. AFRICA ECONOMIC DEVELOPMENT

A study of the economic development of Africa, with particular emphasis upon the relationships between economic growth and the social, political and economic structures of these countries.

132. ASIA ECONOMIC DEVELOPMENT

A study of the economic development of Asian countries with particular emphasis upon the relationships between economic growth and the social, political, and economic structures of these countries.

133. SOVIET ECONOMIC DEVELOPMENT

A study of the economic development of the Soviet Union since the Communist Revolution.

134. GROWTH DYNAMICS AND PLANNING

A study of various theoretical growth models and their application to development and planning and project evaluation.

140. URBAN ECONOMICS

This course examines the economics of urban problems with emphasis on location and land use, the housing market, and transportation. The interaction of location and land use decisions with the housing market and the transportation system is analyzed with reference to the amelioation of urban problems. Prerequisite: Economics 114 or permission of instructor.

150. LABOR ECONOMICS

A study of labor productivity, incomes, employment and how these are affected by labor organizations and labor legislation.

160. THE ECONOMICS OF POVERTY

A study of the economic conditions which lead to poverty and possible alternative policies directed at modifying such conditions.

180. INTERNATIONAL ECONOMICS

An analysis of the theory of international trade, of problems in balance of payments adjustments, and of international policies. Prerequisite: Economics 114.

188. JUNIOR SEMINAR

Modern economic theories and problems. Reserved for Honors students.

189. SENIOR SEMINAR

Modern economic theories and problems. Reserved for Honors students.

190. INDEPENDENT STUDY

191. INTERNSHIP

Opportunity for selected upper division students to work in local governmental units or firms. Prerequisite: Upper division standing and approval of the Undergraduate Committee.

COLLEGE OF SCIENCES
DEPARTMENT OF MATHEMATICS

Gerald L. Alexanderson, M.S., *Chairman*

Professors: Gerald L. Alexanderson, Karel L. deBouvere, S.C.J., Irving Sussman
Assistant Professors: Michael Chamberlain, Grant Fraser, Leonard F. Klosinski, David E. Logothetti, Jean J. Pederson, Gordon E. Ritchie
Lecturer: Alice J. Kelly, Robert C. McCarty

The Department of Mathematics offers work leading to a major or a minor in mathematics, as well as required and elective courses for students majoring in other fields. The major may be pursued with three principal goals in mind: preparation for graduate work in mathematics or other related fields leading to advanced degrees; preparation for secondary school teaching of mathematics; preparation for a career in research for industry or government.

Graduate work is offered in the Department only for the degree Master of Science in the Teaching of Mathematics; for a description of this degree, see the *Graduate School of Humanities Bulletin*. For a description of the degree Master of Science in Applied Mathematics offered by the School of Engineering, see the *Graduate Programs Bulletin of the School of Engineering*.

Requirements for the Bachelor of Science Degree

Students majoring in mathematics are required to take lower-division courses numbered 11, 12, 13, 21, 52, and 53, together with an approved selection of seven upper-division courses (numbered above 100). The upper division courses must include 102 and 111. Students planning to go on to graduate school should take 105, 112, 153, and 154. Specific admission to upper division standing must be obtained by the student before he is allowed to undertake the more advanced courses; this permission will be granted only to students whose performance in lower-division courses clearly indicates the aptitude and interest necessary for advanced work.

Majors in mathematics are required to take Physics 4 to satisfy their natural sciences requirement. An additional course, usually Physics 5, is required of all mathematics majors. This additional course may, however, be Economics 111 or 112 if the student has a special interest in mathematical applications in the social sciences or economics. Majors intending to become teachers of mathematics in secondary schools may substitute Physics 1 and 2 for the above courses, with the approval of the Chairman of the Department.

Physics 131 and 132, Introduction to Mathematical Physics I and II, may be taken to satisfy departmental requirements in mathematics.

Majors in mathematics will be required to demonstrate ability to read a mathematical work in French, German, or Russian prior to graduation.

A major in mathematics with emphasis in computer science is offered by the Department to students planning careers in research in government or industry. Students interested in course outlines for this major should request such a list from the Chairman of the Department. Outlines are also available describing the major leading in a fifth year to the teaching credential of the State of California.

Honors Program

The Department maintains a program for the discovery, encouragement and development of mathematical talent among undergraduates. This program includes special sections, seminars, individual conferences and directed study guided by selected faculty members. An active Undergraduate Research Participation Project is directed by members of the Department.

1. ALGEBRA AND TRIGONOMETRY

Topics in college algebra and trigonometry. Intended for students who wish to take further work in mathematics. Permission to enroll must be obtained from the Chairman of the Department.

2. MATHEMATICS FOR ELEMENTARY SCHOOL TEACHERS

Topics include sets, number systems, inequalities and equations, and other basic topics in modern mathematics.

6. MATHEMATICAL ANALYSIS FOR SOCIAL SCIENCE I

An introduction to finite mathematics with applications to the social sciences. Sets, logic, combinatorial problems, probability, vectors and matrices.

7. MATHEMATICAL ANALYSIS FOR SOCIAL SCIENCE II

An introduction to differential and integral calculus with applications to the social sciences. Mathematics 7 and Mathematics 11 cannot both be taken for credit. Prerequisite: 6 or permission of the instructor.

11. ANALYTIC GEOMETRY AND CALCULUS I

Differentiation and applications, integration. Mathematics 7 and Mathematics 11 cannot both be taken for credit. Prerequisite: four years of high school mathematics (including trigonometry) or satisfactory grade in 1.

12. ANALYTIC GEOMETRY AND CALCULUS II

Continuation of 11. Applications of integration, transcendental functions, determinants and linear equations.

13. ANALYTIC GEOMETRY AND CALCULUS III

Polar coordinates, hyperbolic functions, vectors, parametric equations, solid analytic geometry, partial differentiation. Prerequisite: 12.

21. CALCULUS AND DIFFERENTIAL EQUATIONS

Multiple integration. Infinite series. Complex numbers and functions. Introduction to ordinary differential equations. Prerequisite: 13.

22. DIFFERENTIAL EQUATIONS

Use of series, numerical and transform methods in solving differential equations. Introduction to partial differential equations. Prerequisite: 21.

32. MATHEMATICAL LOGIC

Introduction to formal methods in elementary logic; propositional calculus and simple predicate calculus. Connections with set theory and algebra. Recommended as an elective for mathematics majors and other students planning to pursue further work in logic and foundations. Recommended for 133.

52. INTRODUCTION TO MODERN ALGEBRA

Groups, fields, integral domains, applications to number theory. Polynomials and polynomial equations.

53. LINEAR ALGEBRA

Vector spaces, linear transformations, algebra of matrices, quadratic forms, characteristic equations.

99. LOWER-DIVISION SEMINARS

Basic techniques of problem solving and topics in algebra, geometry, and analysis.

101. A SURVEY OF GEOMETRY

Topics from projective, advanced Euclidean and non-Euclidean geometries.

102. ADVANCED CALCULUS

Vector calculus, functions of several variables, elliptic integrals, line integrals, uniform convergence, introduction to Fourier series.

105. THEORY OF FUNCTIONS OF A COMPLEX VARIABLE

Analytic functions, Cauchy integral theorems, power series, conformal mapping. Riemann surfaces. Prerequisite: 153.

107. MODERN ELEMENTARY MATHEMATICS I

Designed for in-service secondary school teachers. Topics in elementary mathematics treated in a manner emphasizing the underlying structure and fundamental concepts. (107 and 108 may not be taken to fulfill the requirements of a major in mathematics.)

108. MODERN ELEMENTARY MATHEMATICS II

A continuation of 107. This course may be taken independently of 107 upon the consent of the instructor.

111. ABSTRACT ALGEBRA I

Topics from the theory of groups. Prerequisites: 52 and 53.

112. ABSTRACT ALGEBRA II

Rings and ideals, algebraic extensions of fields, Galois Theory. Prerequisite: 111.

113. TOPOLOGY

Set theory insofar as pertinent to the course. Topological spaces, continuous functions, product spaces. Separability and compactness. Metric spaces and metric topologies.

122. PROBABILITY AND STATISTICS I

Axioms and postulates; combinatorial problems; conditional probability; independence; random variables; distributions. Prerequisite: 21.

123. PROBABILITY AND STATISTICS II

Expectation; characteristic functions; infinite sequences of random variables; point estimation; statistical hypotheses; confidence intervals.

133. LOGIC AND FOUNDATIONS

Deductive theories. Theories and models. Consistency, completeness, decidability. The theory of models. The cardinality of models. Some related topics of metamathematics and foundations. This course is open to upper division students of science and mathematics and to philosophy majors having sufficient logical background. Prerequisite: 32 or equivalent.

134. SET THEORY

Naive set theory. Cardinal and ordinal arithmetic. The axiom of choice and the continuum hypothesis. Axiomatic set theory.

144. PARTIAL DIFFERENTIAL EQUATIONS

Special topics in higher mathematics useful in applications to the physical sciences, such as special functions of mathematical physics. Fourier series, partial differential equations, and boundary value problems.

153. INTERMEDIATE ANALYSIS I

A rigorous investigation of the real number system. Concepts of limit, continuity, differentiability of functions of one real variable, theorems of differential and integral calculus. Prerequisite: 102.

154. INTERMEDIATE ANALYSIS II

A continuation of 153.

155. DIFFERENTIAL EQUATIONS

Existence and nature of solutions; oscillation theory, orthogonal functions. Partial differential equations. Prerequisite: 102.

162. HISTORY AND METHODOLOGY OF MATHEMATICS

An introduction to mathematical techniques along with a survey of important problems in mathematics with their historical background. This course is designed for non-science students in the Honors Program.

164. COMPUTER LANGUAGES AND AUTOMATA THEORY

Investigation of various languages such as ALGOL, BASIC, APL. Turing machines, algorithms, and introductory simulation. NCX

165. MATHEMATICAL STRUCTURE OF COMPUTERS

Machine language programming. Mathematical logic and logical design of a digital computer. NCX

166. NUMERICAL ANALYSIS

Interpolation formulas. Numerical differentiation and integration. Numerical solution of algebraic, transcendental, and differential equations. Prerequisite: 102.

168. DIFFERENTIAL GEOMETRY

Introduction to curves and surfaces. Differential forms, Frenet formulas, frame fields, differentiation on surfaces. Prerequisite: 53.

170. DEVELOPMENT OF MATHEMATICS

A selection of mathematical concepts given with their historical context. Upper-division standing in a science major is required.

172. PROBLEM SOLVING

Use of induction, analogy, and other techniques in solving mathematical problems.

175. THEORY OF NUMBERS

Fundamental theorems on divisibility, primes, congruences. Number theoretic functions. Diophantine equations. Quadratic residues. Partitions.

179. MATRIX THEORY

Linear transformations, matrices and determinants, quadratic forms, Cayley-Hamilton Theorem.

190-195. INDEPENDENT STUDY

Reading and investigation for superior students under the direction of a staff member.

199. UPPER DIVISION SEMINARS

Advanced topics in algebra, geometry, or analysis. Research projects.

(Note: Some upper-division courses, e.g., 133, 134, 144, 155, 164, 165, 166, 172, are given only in alternate years.)

COLLEGE OF SCIENCES
DEPARTMENT OF PHYSICS

William A. Barker II, Ph.D., *Chairman*

Professors: James Albertson, S.J., *Academic Vice President*; William A. Barker II;
John B. Drahmann, *Dean, College of Sciences*
William T. Duffy, Jr., Philip T. McCormick
Associate Professor: Carl H. Hayn, S.J.
Assistant Professor: Geoffrey T. Fox

A minimum of nine courses beyond Physics 4, 5, 6 and 11 or 4, 9, 10 and 11, is required for the Bachelor of Science degree with the major in Physics. An average grade of C or better must be maintained in courses in the major. The required courses will normally include Physics 70, 101, 102, 111, 112, 120, 121, 122 and 170. Mathematics 102 and Chemistry 1, 2 are required of all students majoring in Physics.

Our undergraduate program provides an appropriate preparation for careers in physics, astronomy and astrophysics, biophysics, environmental sciences, geological sciences and geophysics, and oceanography.

Students with an interest in physics should obtain from the department a copy of "Information for Majors." They are encouraged to discuss career opportunities and curricula with their academic advisor and with members of the physics staff. Some students who major in physics as undergraduates enter graduate school for more advanced work leading to the M.S. or Ph.D. degrees. Some go to Law School or Medical School. Others become teachers in secondary schools or find employment in government or industrial laboratories. Much current research, both pure and applied, tends to cut across the traditional academic disciplines, and the broad training of physics with its stress on fundamentals is particularly and uniquely valuable. A secondary school teaching credential may be obtained in a five-year program in cooperation with the Department of Education.

Honors Program

Students majoring in physics may participate in the University Honors Program. The Department of Physics offers several courses specifically limited to Honors students or physics majors. They include Physics 9, 10, 90, 99, 190 and 199. The courses in Physics Research and Independent Study in Physics offer the Honors Student or physics major an unusual opportunity. The student who elects these courses will work on experimental or theoretical research under the close supervision of one of the physics faculty. This may involve research performed in a cooperative effort with industry or the government. The student thereby gains valuable experience in the methods and techniques used in modern physics research and teaching.

1. GENERAL PHYSICS I

Mechanics, relativity, sound, and electricity. Laboratory. Prerequisite: Mathematics 1 or equivalent. Fall term.

2. GENERAL PHYSICS II

Electromagnetism. Electromagnetic waves. Optics, heat, quantum mechanics. Particle physics. Laboratory Prerequisite: I. Winter term.

3. INTRODUCTION TO ASTRONOMY

Descriptive study of solar system, stellar astronomy, the galaxy, the universe. Demonstrations and observations with 8-inch and 16-inch refracting telescopes. Restricted to students not majoring in physics, chemistry, biology or engineering. Prerequisites: elementary algebra and geometry.

4. PHYSICS FOR SCIENTISTS AND ENGINEERS I

Measurement. Vectors. Equilibrium conditions. Newton's Laws. Constant acceleration. Special relativity. Particle dynamics. Work and energy. Momentum. Collisions. Rigid body rotational motion. Laboratory. Prerequisites: Mathematics 11, 12. (Mathematics 12 may be taken concurrently.) Spring term.

5. PHYSICS FOR SCIENTISTS AND ENGINEERS II

Oscillatory motion. Gravitation and fields. Electrostatics. Gauss' law. Potential. D.C. circuits. Dielectrics. Magnetic fields. Magnetic induction effects. Magnetic materials. A.C. circuits. Electromagnetic waves. Laboratory. Prerequisites: 4, Mathematics 13 (Math may be taken concurrently). Fall term.

6. PHYSICS FOR SCIENTISTS AND ENGINEERS III

Waves, reflection and refraction. Interference. Diffraction. Optical instruments. Resonance. Quantum phenomena. Ideal gases. Thermal properties. Thermodynamics. Laboratory. Prerequisites: 5, Mathematics 21 (may be taken concurrently). Winter term.

9. FUNDAMENTALS OF PHYSICS II (HONORS)

Electrostatics: charges and fields. Electric potential. Electric fields around conductors. Electric currents. Prerequisites: Physics 4 with an A or by consent of the instructor, Mathematics 13 (may be taken concurrently). Fall term.

10. FUNDAMENTALS OF PHYSICS III (HONORS)

Fields of moving charges. Magnetic field. Electromagnetic induction and Maxwell's equations. Alternating current circuits. Electric fields in matter. Magnetic fields in matter. Laboratory. Prerequisite: 9. Winter term.

11. PHYSICS FOR SCIENTISTS AND ENGINEERS IV

Elementary modern physics. Special relativity. Quantum effects. Hydrogen atom. Many-electron atoms. X-rays. Nuclear structure. Nuclear reactions. Molecular and solid-state physics. Laboratory. Prerequisite: 6 or 10. Spring term.

50. EARTHQUAKES AND OCEANS

A brief study of the nature, causes and effects of earthquakes; the drift of continents, geo-magnetism, the structure of the ocean floor, isostasy, tidal forces and the role played by these as remote causes of earthquakes.

70. ELECTRONIC CIRCUITS FOR SCIENTISTS I

Linear electric circuits. Phasor analysis, transients and Fourier series. Network theorems. Junction diodes, junction triodes and field effect transistors. Voltage and power amplifiers. Laboratory. Prerequisite: 6. Spring term.

90. UNDERGRADUATE PHYSICS RESEARCH

Departmental work under close professorial direction on research in progress. Prerequisite: Permission of the professor directing the research must be secured before registering for this course.

96. INTRODUCTION TO PHYSICAL CONCEPTS

Fundamental physical views of the universe will be examined. Designed for nonscience majors with no college-level mathematics. The course will study concepts of the microcosmos and macrocosmos from the Greek philosophers to quantum theory, and from Babylonian creation myths to relativistic cosmology.

99. INDEPENDENT STUDY IN PHYSICS

Detailed investigation of some area or topic in physics which is not covered in the regular courses, supervised by a faculty member. Prerequisite: Permission of the professor directing the study must be secured before registering for this course.

101. ELECTROMAGNETIC THEORY I

Electrostatic fields. Laplace's and Poisson's equations. Dielectrics. Magnetic fields of steady currents. Induced electromotive forces. Magnetic energy. Magnetic materials. Prerequisite: 6. Winter term.

102. ELECTROMAGNETIC THEORY II

Maxwell's equations. Plane waves in free space and in matter. Reflection and refraction. Interference and diffraction. Polarization. Guided waves. Radiation of electromagnetic waves. Prerequisite: 101. Spring term.

111. CLASSICAL MECHANICS I

Matrices and vectors. Vector calculus. Newtonian mechanics. Gravitational attraction and potential. Oscillatory motion. Nonlinear oscillations. Calculus of variations. Hamilton's principle. Prerequisite: 4. Fall term.

112. CLASSICAL MECHANICS II

Lagrangian and Hamiltonian dynamics. Central-force motion. Two-particle collisions. Noninertial reference frames. Rigid-body dynamics. Small oscillations and normal coordinates. One-dimensional wave equation. Prerequisite: 111. Winter term.

116. PHYSICS OF SOLIDS

Properties of metals, semi-conductors, paramagnetics, and superconductors. Prerequisites: 121, 180 (may be taken concurrently). Spring term.

120. THERMAL PHYSICS

The laws of thermodynamics with applications to ideal and non-ideal systems. Elementary kinetic theory of gases. Entropy. Classical and quantum statistical mechanics. Selected topics from magnetism and low temperature physics. Spring term.

121. ATOMIC AND NUCLEAR PHYSICS I

Bohr atom. Thermal radiation and quantum theory. Particles and waves. Schroedinger's theory of quantum mechanics and applications. Perturbation theory. One-electron atoms. Laboratory. Prerequisite: 11. Fall term.

122. ATOMIC AND NUCLEAR PHYSICS II

Magnetic Moments. Spin. Identical particles. Many-electron atoms. X-rays. Nuclear models. Alpha, beta, and gamma decay. Nuclear reactions. Nuclear forces. Laboratory. Prerequisite: 121. Winter term.

131. METHODS OF MATHEMATICAL PHYSICS I

Matrices and vector spaces. Function space. Fourier analysis and orthonormal sets of function-vectors. Functions of a complex variable. Prerequisite: Mathematics 102. NCX*. Fall term.

132. METHODS OF MATHEMATICAL PHYSICS II

Ordinary differential equations. Boundary conditions and eigenfunctions. Prerequisite: 131. NCX*. Winter term.

170. ELECTRONIC CIRCUITS FOR SCIENTISTS II

Noise. Feedback and servomechanisms. Operational amplifiers and analogue computation. Oscillators. Transmission lines. Digital circuits. Laboratory. Prerequisite: 70. Fall term.

180. QUANTUM MECHANICS

Foundations of wave mechanics. Linear operators and eigenfunctions. Elementary theory of elastic scattering. Matrix mechanics and theory of angular momentum. Perturbation theory and theory of radiative transitions. Prerequisite: Mathematics 102. NCX*. Spring term.

190. UNDERGRADUATE PHYSICS RESEARCH

Departmental work under close professional direction on research in progress. Prerequisite: Permission of the professor directing the research must be secured before registering for this course.

199. INDEPENDENT STUDY IN PHYSICS

Detailed investigation of some area or topic in physics which is not covered in the regular courses, supervised by a faculty member. Occasional arrangements are made for students to work in nearby research laboratories or to help teach high school physics. Prerequisite: Permission of the professor directing the study must be secured before registering for this course.

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* Exempted from challenge.

COLLEGE OF SCIENCES
DEPARTMENT OF POLITICAL SCIENCE

Bernard L. Kronick, Ph.D., *Acting Chairman*

Professors: Bernard L. Kronick, Charles N. R. McCoy
Associate Professors: Stephen Jurika, Jr., Richard Roberts, S.J.
Assistant Professor: Bruce D. Hamlett

Instruction in the Department of Political Science is designed to (1) offer all students courses planned to introduce them to the political aspects of society, and the analysis of political problems; (2) concentrate on providing undergraduate majors with a special program of studies leading to the B.S. degree in political science; (3) lay the basis for careers in the public service, and prepare students for graduate studies.

Students who wish to major in Political Science, in addition to fulfilling the general requirements of the University and those of the College of Sciences, must complete the following departmental requirements:

a) Each Political Science major must take at least eleven term courses in political Science.

b) During the freshman and sophomore years majors are expected to complete four lower-division political science courses.

c) During the junior and senior years majors are expected to complete at least seven upper-division courses.

d) Of the upper-division courses referred to in (c) above, at least one is to be taken in each of these fields: American government and politics, comparative politics, international relations, and political theory.

e) One of the upper-division courses is to be taken in the form of a senior seminar.

f) The student must maintain an average grade of C in the courses in the major.

Honors Program

The Honors Program provides well-qualified students with special opportunities for training and research in political science through seminars, tutorials and small-scale research projects.

Application for admission to the Honors Program normally should be made in the sophomore year. Applicants must have achieved a 3.00 average or better in all University work, and a 3.30 average or better in political science courses.

Honors candidates will complete all requirements for a major in political science and will also submit a senior project during their senior year. Graduation with Honors in Political Science will require (1) a 3.00 average or better in all University work; (2) a 3.30 average or better in political science; (3) the submission of an acceptable senior project; and (4) completion of such courses as the Honors Committee may designate. Interested students should consult the Chairman.

I. Introductory Courses

1. INTRODUCTION TO AMERICAN GOVERNMENT

The underlying principles of the American federal state. Basic ideas of American politics. The structure and powers of the American national government. Principles of the California constitution and government.

2. INTRODUCTION TO COMPARATIVE POLITICS

Government and politics in several modern states. Emphasis upon the development of analytical abilities and critical skills in the evaluation of political behavior, processes, and institutions.

5. POLITICAL GEOGRAPHY

An analysis of the relationships among man, his environment, and his political institutions, especially the internal factors of individual states upon which strategic relationships must be based. Attitudes, frames of reference, habits and beliefs—all the rationale of political and cultural action—are analyzed for agreement or disagreement with the environment. The State is the dominant political phenomenon in the modern world, and its geographical nature, policies, and power are aggregated in terms of its political behavior on a macro-scale.

10. PRINCIPLES OF GOVERNMENT

The nature, origin, and justification of the state. Organization, powers and functions of government. The fundamental questions of politics examined in terms of the natural law and the common good.

15. INTRODUCTION TO POLITICAL PHILOSOPHY AND THEORY

An introduction to the major political philosophers and to the principal themes of normative political theory. The enduring issues of politics are studied through these writings and concepts.

25. INTRODUCTION TO INTERNATIONAL RELATIONS

Origins, forms and forces of the state system. The dynamic elements: power, nationalism, sovereignty, colonialism, imperialism; theories of war and peace. Contemporary problems and case studies.

25.77 HONORS SEMINAR IN INTERNATIONAL RELATIONS NCX*

50. FRESHMAN SEMINAR

Major issues of domestic and/or international policies. Specific course subject matter announced prior to registration. Limited to twelve students. Permission of instructor required. NCX*

91.77 HONORS SEMINAR IN POLITICAL PHILOSOPHY NCX*

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* Exempted from challenge.

99. SOPHOMORE COLLOQUIUM IN POLITICAL SCIENCE

Restricted to sophomore political science majors. (Selected problems in political studies.) Methods and theory of political analysis. Specific course subject matter announced prior to registration. NCX*

II. Political Theory

111. CLASSICS OF POLITICAL THOUGHT AND MODERN POLITICAL ANALYSIS I

The relevance of the classics of political thought for understanding modern scholarship in political science.

112. CLASSICS OF POLITICAL THOUGHT AND MODERN POLITICAL ANALYSIS II

113. AQUINAS AND POLITICS

A consideration of the main elements of the political thought of St. Thomas and its relevance to modern political and legal problems. Attention will be given to some modern departures from his thinking.

114. MODERN POLITICAL ANALYSIS

Survey of modern empirical studies of various aspects of political behavior. Will evaluate the theoretical contributions of several contemporary political scientists, particularly as they relate to the problems of political change and development.

III. International Relations

125. INTRODUCTION TO INTERNATIONAL LAW

Sources of international law, functions of international law in international politics. Control of power politics by law, effectiveness of international agreements as instruments of peaceful change, settlement of international disputes.

127. COMPARATIVE FOREIGN POLICIES

Comprehensive comparative study of the foreign policies of several nation-states, including Great Britain, France, Germany and China. Interaction of international and domestic politics on foreign policy formulation and implementation.

128. AMERICAN FOREIGN POLICY

The conduct and control of American foreign policy as illustrated by the main trends and crises of the last twenty years.

129. SOVIET FOREIGN POLICY

An analysis of Soviet foreign policy within both the communist world and the international political system. Consideration of impact of ideology on policy formulation. Particular consideration of Sino-Soviet dispute.

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* Exempted from challenge.

130. THE DEVELOPING NATIONS

A multi-disciplinary study of the problems and politics of political development in Latin American, Africa and/or Asia. Case studies of the Communistic and Capitalistic approaches to political development. Impact of international politics on internal development.

135. FAR EASTERN INTERNATIONAL RELATIONS

International political developments in the Far East from 1900 to the present. Emphasis on China, Japan, Korea, and Southeast Asia. Geographic environment, political forces, and the impact of differing cultures on the governmental decision making process.

IV. Comparative Politics

141. POLITICAL LEADERSHIP

The study of political leadership in terms of personality, role, organization, task, values and setting. Explanations of motivation and behavior in political leadership are sought in elite analysis belief systems, statecraft, personality theory, charismatic effects, psychobiography and medical histories.

143. MAIN FORCES IN EAST ASIAN POLITICS

An analysis of the nature, structure, and channels of political power in major East Asian nations. Geographical, cultural, institutional aspects of indigenous political forces. Emphasis on continuity of political goals, means, and social change.

144. POLITICS IN WESTERN EUROPE

An analysis of the nature, structure, and utilization of political power in representative continental European states. Institutional, ideological, cultural, and psychological aspects of politics are treated. Emphasis upon problems of political stability and social change.

145. SOVIET POLITICS

An analysis of the Soviet political system and its ideological premises. The origin and development of the Soviet party-state and its processes of government and politics.

146. COMPARATIVE POLITICAL POWER AND SOCIAL STRATIFICATION

A comparative study of the sources, distribution, and interrelations of economic, political and social power with emphasis on industrialized societies. The main questions dealt with are: "who owns the country?", "who runs the country?", "who gets what when and how?"

V. American Government and Institutions

150. THE PRESIDENCY

An analysis of the role of the President and the Executive Office of the President in the national political system. Emphasis is placed on the President's roles as Commander-in-Chief and as Chief Executive of Foreign Policy, although presidential leadership, staffing, and policy formation are provided suitable attention.

152. U.S. POLITICAL PARTIES

Origin, organization, and activities of U.S. political parties. Work of politicians, bosses, and machines. Government regulations and possible subsidy of parties. Election law and administration. Prerequisite: 1.

157. AMERICAN CONSTITUTIONAL DEVELOPMENT I

Historical treatment spanning 1607–1890. Topics include English and colonial constitutional heritage; U.S. Constitution, 1789; landmark cases interpreting the Constitution; nature of the Union; slavery; Civil War; rise of judicial restraints on legislative economic regulation. Prerequisite: 1 or equivalent.

158. AMERICAN CONSTITUTIONAL DEVELOPMENT II

Historical treatment spanning 1890 to present. Topics include heyday and decline of judicial restraints on legislative economic regulation; judicial sanction to extensive national economic regulation; the Constitution in two World Wars; the Supreme Court's modern emphasis on civil liberties. Prerequisite: 1 or equivalent.

159. CURRENT U.S. CONSTITUTIONAL LAW

Survey of current U.S. constitutional law of interest to the informed citizen, including interstate and foreign commerce, equal protection of the laws, freedom of speech and press, criminal justice. Behavioral and other approaches to study of the judicial process. Instruction in use of a law library. Prerequisite: PO I or equivalent.

162. U.S. URBAN GOVERNMENT AND POLITICS

Survey of legal powers, structure, administration of cities. Metropolitan governments. Problems of revenue, law enforcement, public utilities, planning. Equality of opportunity and poverty. Each student does individual field work in selected area of local government.

163. U.S. STATE GOVERNMENT

The development of state constitutions. Federal-state relations. Politics and elections. The legislative process. The courts. County government. The organization and current major problems of state administrative system.

164. THE CONGRESS

Legislative behavior. The relationship between governmental agencies, interest groups and the legislative process: the orientations of legislators to their functions and their constituencies.

165. PUBLIC ADMINISTRATION IN THE U.S.

Survey of the field of public administration: organizational theory, executive leadership, personnel administration, finance, administrative law, administrative responsibility. Examples from various levels of American government.

VI. Senior Course Work

180.1, 180.2, 180.3 DIRECTED READING

For students who wish to do intensive reading in areas not emphasized by the Department or to do further independent study on specific topics not fully covered in upper-division courses.

185. SEMINAR IN ARMS CONTROL AND DISARMAMENT

A study of the sources of international conflict and the control of weapons. Will consider man's nature and its relationship to war, the role of national and international systems in promoting arms and control negotiations, and the effect of technological change upon concepts of power and of security. Specific consideration to arms control and disarmament proposals since World War II.

186. INTER-NATION SIMULATION RESEARCH

Involves the study of international politics through the use of simulation or gaming techniques. Students participate both as directors of the research project and as formulators of the states' strategies and actions. Prerequisites: 25 and permission of the instructor. NCX*

187. COLLOQUIUM NCX

Group meetings for reading, research and discussion of selected political problems.

187.01 American Politics
187.02 Comparative Politics
187.03 International Politics
187.04 Political Philosophy
187.05 Empirical Political Analysis

188. TASK FORCE IN INTERNATIONAL RELATIONS NCX

A task force approach to the study of specific international political problems. Research findings will be presented to the campus community by means of carefully prepared briefings. Admission to the course by permission of the instructor.

189. SCOPE AND METHODS OF POLITICAL SCIENCE

Consideration of the history, methodology and focus of research in political science. The development and implications of the behavioral sciences for the study of politics. NCX*

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* Exempted from challenge.

190. SENIOR HONORS PROJECT

For senior honors students working under the direction of political science faculty in preparation of senior project. NCX*

191. SEMINAR IN POLITICAL PHILOSOPHY

A consideration of the foundations of twentieth century political thought. NCX*

192. SEMINAR IN CHURCH AND STATE

Traditional theories of Church and State are examined and evaluated in light of contemporary orientation of the problem of the relation of religion to secular life. NCX*

193. SEMINAR IN INTERNATIONAL ORGANIZATIONS

Institutionalization of international politics; development, principles, and procedures of international political, administrative and judicial organzations, emphasizing capabilities for management of power, settlement of disputes, and peaceful change. NCX*

194. SEMINAR IN MILITARY STRATEGY AND NATIONAL POLICY

Strategy and policy-making for United States national security, with special study of the substance and shadow of governmental processes by which policy is made. Case study of six major crises (Berlin, Korea, Suez, Cuba, Taiwan, Vietnam) relating military strategy and American national security policy. NCX*

195. SPECIAL TOPICS IN POLITICAL SCIENCE

This course, conducted in seminar fashion, is designed for senior majors. By means of papers and assigned readings it covers aspects of political science not elsewhere intensively developed and helps the students to intgrate materials studied previously. Emphasis will be placed upon interdisciplinary problems and approaches.

196. SEMINAR IN INTERNATIONAL RELATIONS

A consideration of selected aspects of international political behavior.

197. SEMINAR IN CIVIL LIBERTIES

Open to political science majors, and others by permission of the instructor.

198. TEACHING INTERNSHIP

This internship is designed for those who plan to enter teaching as a career and for others who may be invited to serve as readers and/or discussion leaders in lower-division political science classes.

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* Exempted from challenge.

199. PRACTICUM IN PUBLIC AFFAIRS

An opportunity to use the skills and tools of the political scientists in political offices and institutions, in governmental departments and agencies, and in politically-related aspects and areas of non-governmental enterprises. May be taken on a part-time basis as a one or two term course equivalent or on a full-time basis as a three term course. Admission by invitation only.

GEOGRAPHY

1. HUMAN GEOGRAPHY

World survey of man's occupation and utilization of the earth. Basic interrelations of human life and elements of natural environment.

4. ECONOMIC GEOGRAPHY

Relation, from the world point of view, of man's industries (agriculture, lumbering, mining and quarrying, manufacturing, transportation, commerce) to the natural environment.

5. WORLD REGIONS—CONTEMPORARY PROBLEMS

Types and distribution of political systems in selected regions; factors which affect political power; areas of conflict and arbitration.

107. GEOGRAPHY OF ASIA

The course has a central theme which makes it distinctive. It emphasizes the changing political and economic geography of Asia, and illustrates the various problems and potentials of the Asian nations, to provide not merely a random description but a more basic understanding of the processes of change which are radically transforming the Asian landscape.

110. GEOGRAPHY OF LATIN AMERICA

The profound shock waves of discontent typical of political alienation and instability—the overthrowing of governments, the resignations of cabinets, political assassinations, student riots, labor violence, and organized insurgency—are responses to the geographic imperatives and cultural antecedents. The course examines and evaluates the basic geographic and concommitant cultural factors which provide the matrix for the economic and political discontent.

COLLEGE OF SCIENCES

DEPARTMENT OF PSYCHOLOGY

Roland C. Lowe, Ph.D., *Chairman*

Associate Professor: Marvin L. Schroth
Assistant Professors: Roland C. Lowe, Wendell J. Goesling,
Derald W. Sue, Eleanor W. Willemsen

Students majoring in Psychology, in addition to fulfilling the general requirements for a Bachelor of Science degree, must successfully complete the following courses: Mathematics 6 and 7, Biology 7 and 8, Psychology 10, 11, 100, and six additional upper division electives, to be selected with advisor.

Students who plan to go into related fields such as special education, primary or secondary teaching should select with their advisors a group of courses in Psychology and Education specifically geared to their objectives.

Students planning graduate work towards the Ph.D. in Psychology should take Psychology 110 and 130 and courses relevant to their individual goals in Physics, Chemistry and Computer Science.

Honors Program

The department of Psychology provides a special program designed to meet the needs of those students showing exceptional scholastic promise and likelihood of continuing on to psychology graduate school.

The Honors student will become involved in the following special programs:

1. Special seminars in the department.
2. Ongoing research being conducted by staff members and psychology majors.
3. An independent piece of research in the senior year.
4. Attendance in courses in other departments selected to broaden the student's background.

1. GENERAL PSYCHOLOGY

Introduction to the scientific study of behavior. Topics covered include perception, motivation, intelligence and abnormal behavior. Primarily for non-majors.

5.77. HONORS COLLOQUIUM

Restricted to Honors Program students. Major issues in Psychology.

10. PSYCHOLOGY AS A NATURAL SCIENCE

The scientific study of human and animal behavior in terms of sensation, perception, learning, motivation, and emotion. Emphasis also placed on the physiological bases of behavior. Introduction to research methodology and statistical analysis of data.

11. PSYCHOLOGY AS A SOCIAL SCIENCE

Principles of human development, intelligence, abilities, personality. Psychological measurement. Sociopsychological influences on behavior. Further exposure to research methodology and additional statistical techniques. Psychology majors only.

50. PSYCHOLOGY OF ADJUSTMENT

An introduction to the psychology of personal and social adjustment. Personality patterns of the individual in various contexts, such as family, the school, marriage, the adolescent years, social relations.

80. CHILD PSYCHOLOGY

This course will survey development from birth to puberty. It is intended primarily for those who will not be taking the Psychology 181, 182, 183 sequence. Primarily for non-majors. Prerequisite: Psychology I recommended.

90. INDEPENDENT RESEARCH

This course provides research training for qualified freshmen and sophomores.

100. STATISTICAL AND EXPERIMENTAL DESIGN I

Statistical theory, methods, and principles underlying psychological experimentation and measurement. Indices of location and variability, sampling theory and statistical inference. Correlational theory. Prerequisites: 10, 11.

105. STATISTICS AND EXPERIMENTAL DESIGN

Advanced topics in theory and methods of statistical analysis and experimental design. Topics include complex analysis of variance, multiple correlation and regression, factor analysis, and an introduction to nonparametric statistics. Prerequisite: 100.

110. EXPERIMENTAL PSYCHOLOGY I

A survey of the experimental literature in learning, motivation, sensation and perception, and social behavior. Application of experimental design and statistics. Lectures and laboratory. Prerequisite: 100.

112. MOTIVATION AND EMOTIONS

The scientific study of the various motivational-emotional processes of man and higher animals. How motives and emotions initiate or direct behavior.

115. INTRODUCTION TO ABNORMAL PSYCHOLOGY

A comprehensive treatment of the major forms of mental disorder with regard to their etiology, nature, development, and therapy. Current theories of mental disease. The psychology of abnormal thinking. Prerequisite: 1.

130. PSYCHOLOGY OF LEARNING AND THOUGHT PROCESSES

A survey of the experimental literature on the basic forms of the learning process. Demonstrations in creative problem solving. The nature of concept formation. Prerequisite: 100.

135. DEVELOPMENTAL PSYCHOLOGY SEMINAR

This course will be a small enrollment discussion class for Psychology Majors. Students will pursue readings from the original theoretical and empirical journal literature on some topic area from Developmental Psychology. The topic for 1973-74 will be Piaget's theory. All students will prepare research proposals as term projects. Prerequisite: Either Psychology 185, 186, or 187.

136. PSYCHOLOGY OF SEX DIFFERENCES

This course will deal with culturally defined sex roles and sex differences in personality, cognition, and biology. The processes by which sex differences develop will be discussed. The social-learning, cognitive-developmental, and psychoanalytic views will all be treated. Writings from the current movement for a change in traditional sex roles will be read and students will be encouraged to examine the relation between course materials and their own lives.

138. THE EXCEPTIONAL CHILD

This course will survey the problems of mental retardation and (so called) mental illness in children. The course will survey various kinds of problems and the means of aiding the children involved by means of psychotherapy and/or special education. The special problems of the gifted child will also be discussed. Prerequisite: One of Psychology 185, 186, 187 and 80.

140. RESEARCH IN CHILD PSYCHOLOGY

Application of research methodologies to study of child development. Individual research projects required. Prerequisite: 100 and 110.

145. PSYCHOLOGICAL MEASUREMENT

Principles and problems of measurement in psychology, especially as related to tests of attitudes, aptitudes and personality. Students construct, administer, score, interpret, and evaluate tests.

150. SOCIAL PSYCHOLOGY

Study of the influence of social environment on psychological processes and behavior. Topics covered include, for example, person perception, social comparison processes, attitude change, aggression, behavior in small groups.

160. THEORIES OF PERSONALITY

Critical analysis of major theories of personality with emphasis on practical and research implications. NCX*

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*Exempted from challenge.

NB: Upper-division credit in psychology may be given for Sociology 150.

165. PHYSIOLOGICAL PSYCHOLOGY

Physiological bases of behavior in terms of neural, glandular and visceral processes. Neurophysiological correlates of behavior with emphasis on motivation and learning. Lectures and laboratory, Prerequisite: permission of instructor.

170. SYSTEMS, THEORIES, AND MODELS IN PSYCHOLOGY

Origin and development of modern psychology. Structuralism, Functionalism, Behaviorism, Gestalt Psychology in terms of sensation, perception, learning, thinking, etc. Miniature systems and models. NCX*

182. SEMINAR IN THE PSYCHOLOGY OF MOTIVATION

A series of assigned readings and reports from classic and contemporary sources in the experimental and theoretical literature on motivation. Investigation of special problems. NCX*

184. SEMINAR IN THE PSYCHOLOGY OF LEARNING

A series of assigned readings and reports from classic and contemporary sources in the experimental and theoretical literature on learning and thinking. NCX*

185. EARLY CHILDHOOD**

This course will combine lectures and discussion approaches. It will survey the development of the child from birth through the preschool years (approximately to age six). Some topics to be included are sensory-motor behavior of infants, parent-child relations, intellectual development, nursery school education and day care, childrens' television, and sex role learning. In this course the three major theoretical approaches to child development—those of Freud, Piaget, and the Learning Theorists will be introduced. No prerequisite.

186. MIDDLE CHILDHOOD**

This course will combine lecture and discussion approaches. It will survey the development of the child during the grade school years from approximately age seven to age eleven. Some topics to be covered include: intelligence, achievement, sex role development, peer interaction, the family, moral development, self esteem, political socialization, and the school. These topics will be discussed in the context of the three major theories introduced in Psychology 185. Prerequisite recommended: Psychology 185.

187. ADOLESCENCE**

This course will survey development during the period between puberty and the early twenties. There are two phases to the course. The first focuses on the

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* Exempted from challenge.

** NOTE: Psychology 185, 186, and 187 are designed as a sequence. Students planning to take all three are urged to take them in this order. However, students may take any of the three courses without having taken the others. A student who does this may be asked by the instructor to read some supplementary text material covering the developmental periods missed. All three courses require a project.

meaning of the term adolescence and deals with such topics as identity, intellectual development, physical growth, sex differences, high school education, vocational choice, and the peer culture. These topics, and others, will be discussed in the context of the three theories introduced in Psychology 185. The latter part of this course will consist in reports from student task forces or such applied topics as "The adolescent and the drug scene," "Sex education for adolescents," "The disadvantaged adolescent," "The homosexual adolescent," "Special problems of female adolescence," "Education for the adolescent," "The role of athletics in guidance of adolescents," etc. Suggested prerequisites: Psychology 185, 186.

190, 191, 192. INDEPENDENT RESEARCH

Independent projects for special senior students involving both experimental and theoretical research. NCX*

195. ADVANCED SEMINAR

Intensive focus on selected topics which vary from year to year.

197, 198, 199. PRACTICUM

Clinical experience in community agencies. Involves selected readings. Open to seniors with average GPA of 3.00 or better. Present practicums include child development, psychotherapy with children, and occupational therapy.

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* Exempted from challenge.

COLLEGE OF SCIENCES
DEPARTMENT OF SOCIOLOGY/ANTHROPOLOGY

Witold Krassowski, Ph.D., *Chairman*

Professor: Witold Krassowski
Associate Professor: Paul Verden
Assistant Professors: Kichiro K. Iwamoto, Nancy Olsen
Acting Assistant Professors: Joseph R. De Martini, Dennis B. McGilvray, Roland M. Wagner

The scholastic policy of the Department aims at the study of Sociology by stressing the scientific aspects of the discipline, rather than the melioristic or all-inclusive philosophical approaches.

Students who wish to make Anthropology their major area of emphasis must, besides completing the other requirements of the department, College of Sciences, and of the University, pass Anthropology 1, 3 and a minimum of four upper-division courses in Anthropology.

Students who wish to make Sociology their major subject, besides completing the other general requirements of the College of Sciences and of the University, must pass a minimum of one course from among Sociology 1, 11, 13 or Anthro. 3 and complete Sociology 18, 19 and 55.

The major program must include eight courses of upper-division work in Sociology and/or Anthropology. All courses selected in the major must have the approval of the Chairman of the Department or the student's Academic Counselor. The student must maintain an average grade of C in the courses in the major.

Students who intend to go into primary or secondary school teaching, and who wish to make Sociology their teaching minor, in order to fulfill the state teaching requirement, should, in addition to completing Sociology 1, select a minimum of four upper division courses from among the following: Sociology 110, 129, 143, 150, 156, 159, 161, 165, 170, and 171.

Honors Program

Outstanding students in Sociology will be invited to participate in the University Honors Program. This four-year program will provide students with particularly challenging and stimulating learning experiences corresponding to their academic potential.

Students involved in the Honors Program will take full advantage of specially developed approaches to learning, as well as the most advanced learning techniques. Students participating in the Honors Program

1. Will be expected to take certain advanced courses in the department offered only for exceptional students.
2. Will attend special sections in required courses.
3. Will be permitted to take full advantage of independent and seminar study techniques; they will be invited to participate in the seminars instituted for outstanding students.
4. Will receive careful and complete attention of the departmental faculty in the design and execution of research projects geared to the individual interests of the student, and they will be encouraged to participate in the departmental

research projects, working with, and under the special supervision and guidance of, the professors of their major department.

5. Will be required to initiate, develop, and report on an independent thesis project and complete the Graduate Record Examination in Sociology.

SOCIOLOGY

1. PRINCIPLES OF SOCIOLOGY

An introduction to the field of sociology with applications of sociological principles to our present society.

1.77. HONORS SEMINAR IN PRINCIPLES OF SOCIOLOGY NCX

11. SOCIETY AND THE INDIVIDUAL

The study of individuals in their groups and society. Topics include leadership, attitude change, conformity and mental illness.

13. AMERICAN SOCIETY—WHAT'S HAPPENING

A mutual exploration of the potential and limitations of the sociological perspective for enhancing personal liberation within the constraints of an advanced industrial civilization.

18. INTRODUCTION TO SOCIOLOGICAL THEORY

A course focusing on the principal social theories, questions they were trying to answer, and the relations to methodological principles. For Sociology majors only. NCX

19. RESEARCH METHODS

Participant observation, interviews, questionnaires, content analysis, and laboratory experiments. Several of these techniques are actually used to gather and analyze data. NCX.

55. PRINCIPLES OF STATISTICS

Introduction to statistical methods and techniques of elementary statistical analysis. Nature of data, logic of statistical induction, inherent limitations. Averages, variations, index numbers. NCX*

90, 91, 92. SOCIOLOGY COLLOQUIUM

Intensive study of selected issues in Sociology. For freshmen and sophomores only. By permission of instructor. NCX

95, 96. HONORS SOCIOLOGY COLLOQUIUM NCX

110. INTERGROUP RELATIONS

Prejudice and discrimination toward minorities, with particular emphasis upon the current situation in the United States.

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* Exempted from challenge.

116. LOGIC OF SOCIAL INQUIRY

Analysis and discussion on how scientific method may be used in Sociology. the qualitative approaches to the study of the behavioral phenomena. NCX*

117. ADVANCED RESEARCH METHODS

The formulaton and design of research investigations. Definition of the problem, hypothesis testing, development of research design, measurement, data gathering, and analysis and interpretation of findings. NCX*

119. POLITICAL SOCIOLOGY

Conflict, consensus, coercion and authority. The study of the relationship between the social structure and the political order. The social bases of political parties, political movements and the state.

120. COLLECTIVE BEHAVIOR

Analytical study of collective behavior principles; typology of crowds, mass behavior and the characteristics of publics. Introduction to social movements.

129. THE PROCESS OF COMMUNICATION

Communication as a sociopsychological and cultural process. Communication patterns in small groups, and in large organizations. Organization, functions, and development of mass media. Comparisons of systems.

132. SOCIAL STRATIFICATION

Social classes in local communities and the nation.

143. URBAN SOCIOLOGY

Urbanization, its nature, causes, and consequences. Growth and structure of metropolitan areas. Decision-making in cities. New patterns of urban government. NCX

144, 145. URBAN ISSUES I & II

Analysis of social, political, and economic structures of modern city. Impact of state and federal programs. Community planning and development. NCX

147. SOCIOLOGY OF INDUSTRY

Social organization of the work-plant society. Work groups and work relations in formal and informal organizational structures. Industrial conflict: union and management in an interdependent society.

148. SOCIOLOGY OF COMPLEX ORGANIZATIONS

Critical analysis of administrative, economic, and political organizations; their role in modern societies. Structures, functions, and disfunctions. Leadership in specialized interdependent organizations.

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* Exempted from challenge.

150. SOCIAL PSYCHOLOGY

Use of psychological principles in understanding the social behavior of individuals. Topics include social learning, motivation, role playing and exchange.

151. SOCIOLOGY OF SEX ROLES

A sociological analysis of sex differences and sex-role inequalities, including an examination of cross-cultural, historical and contemporary U.S. materials.

152. SOCIALIZATION

The learning of norms and values throughout the life cycle. Cultural and subcultural differences in the process and content of socialization.

153. CHILDHOOD AND SOCIETY

Childhood in various cultures and in historical perspective. Social definitions of childhood in the U.S., and the conflict between community and parental responsibility for children.

156. FAMILY AND KINSHIP

Marriage, the family, and kinship are studied both in our own society and in cross-cultural perspective.

157. SELECTED ISSUES IN FAMILY AND KINSHIP

An intensive study of three or four topics in the field of family and kinship. Prerequisite: Sociology 156 or three upper division Sociology courses or consent of the instructor.

159. SOCIOLOGY OF EDUCATION

The socio-psychological aspects of educational processes and educational institutions in a changing society.

161. SMALL GROUPS

The small group as a research technique and as a social process. Interpersonal influence, social learning, and change in group structure. Experimental demonstrations and class problems. NCX*

165. DEVIANT BEHAVIOR

Examination of such deviant behavior as crime, mental disorder, and alcoholism. Social factors in the etiology and control of deviant behavior.

169. POPULAR CULTURE

A socio-historical analysis of shifting current and significant trends in the development of popular mass cultural activities in America from 1900. Special emphasis will be given to the continued presence of folk and ethnic art forms (including music, dance and humor) and the emergence of a mass entertainment industry.

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* Exempted from challenge.

170. SOCIAL CHANGE

Significant trends and issues in contemporary American society and in the world. The utility of sociological concepts and principles in understanding contemporary society.

171. DEMOGRAPHY

The demographic issues of the modern world: patterns of population growth, problems of quantity, composition, distribution, and quality, and population policies.

193, 194, 195. SEMINAR IN SOCIOLOGY

Courses for juniors and seniors on selected issues in sociology or current problems of social relevance. Conducted as a research seminar. One offered each term. By permission of the instructor only. NCX*

196. DIRECTED RESEARCH

Involves student participation in an on-going research project or the development and execution of a student research project under the supervision of a faculty member. By permission of the instructor only. NCX*

197. DIRECTED READING

For students who wish to do intensive reading in areas not emphasized by the Department or to do further independent study on specific topics not fully covered in upper division courses. By permission of the instructor only. NCX*

198. TEACHING INTERNSHIP

This internship is primarily for those students who plan to enter teaching as a career. They will work under close direction of the faculty member who offers the Principles of Sociology course. Admission by invitation only. NCX*

199, 199A, 199B. PRACTICUM

Opportunity for selected juniors and seniors to work and conduct independent research in community agencies, government bureaus and political or industrial organizations. May be taken on a part-time basis as a one or two term course equivalent or on a full-time basis as a three-term course. Admission by invitation only. NCX*

ANTHROPOLOGY

1. INTRODUCTION TO PHYSICAL ANTHROPOLOGY

The study of the origin and antiquity of man, the fossil evidence for human evolution, primate behavior, and human variation in morphology, serology, and genetics.

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* Exempted from challenge.

3. INTRODUCTION TO SOCIAL AND CULTURAL ANTHROPOLOGY

The concept of culture, the development and evolution of social and cultural analysis of the major sub-systems of culture (economic, echnological, social and political organizations, philosophy and world-view), and selected issues of social concern: racism, cultural determinism, cultural relativity.

3.77 INTRODUCTION TO SOCIAL AND CULTURAL ANTHROPOLOGY, HONORS NCX*

90, 91, 92. ANTHROPOLOGY COLLOQUIUM

Intensive study of selected issues in anthropology. For freshmen and sophomores only. By permission of the instructor. NCX*

93.77. ANTHROPOLOGY COLLOQUIUM, HONORS NCX*

118. CULTURAL ANTHROPOLOGICAL THEORY

A survey of the major schools of thought in the development of social and cultural anthropology, ranging from 19th century cultural evolutionism to contemporary French structuralism.

140. ANTHROPOLOGY OF MODERN LIFE

Study and analysis of human organization, an orientation toward social and cultural processes and values, and social administration.

142. PRIMITIVE SOCIAL ORGANIZATIONS

The analysis of kinship, marriage and descent structures, their evolution and range of variation in world cultures.

149. PSYCHOLOGICAL ANTHROPOLOGY

The inter-relationships among cultural, social, and psychological factors in human behavior. Topics will include cultural influences on perception, personality development in various cultural settings, and psychological explanations of cultural phenomena. Methodological problems will receive special emphasis. Prerequisites: One course in Psychology and one course in Anthropology.

150. ANTHROPOLOGICAL APPROACHES TO THE STUDY OF RELIGION

A comparison of approaches taken by anthropologists and other social scientists to understand the nature of religious beliefs in different cultures. Relation to myth and ritual to social organization, environment, and other systems of thought.

152. POLITICAL ANTHROPOLOGY

Problems of defining and studying political behavior in non-Western cultures. Effects of social, cultural and environmental factors on political organization in selected societies. Emphasis upon comparison of analytical assumptions of different authors.

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* Exempted from challenge.

153. ECONOMIC ANTHROPOLOGY

Patterns of economic activity in primitive and non-Western societies. The interrelationships between economic rationality, social structure, and the cultural milieu. Analysis of change in traditional economic systems.

186. NORTH AMERICAN INDIAN ETHNOLOGY

The range of variation of North American Indian cultures from the Arctic to Mexico; the concept of culture area; modern reservation conditions.

187. ANTHROPOLOGY OF SOUTH ASIA

An introduction to the culture and social structure of India, Nepal, Pakistan, Bangladesh, and Sri Lanka (Ceylon). Topics include geography, prehistory, village life, caste and family patterns, folk religion, and social change.

190, 191, 192. DIRECTED READINGS

An opportunity for students to explore selected topics of interest not presently emphasized by the Sociologfy/Anthropology Department. This could include the fields of archeology, physical anthropology, linguistics, and various specialties within cultural anthropology.

193, 194, 195. SEMINAR IN SOCIAL AND CULTURAL ANTHROPOLOGY

Seminars on selected topics of interest, including the following: American Indian philosophy and world-view; caste in south Asia; family structure in east Asia; myth and ritual; medical anthropology; anthropology of modernization; ethnoscience; cross-cultural studies; intensive studies of specific cultures; techniques of anthropological fieldwork.

SCHOOL OF BUSINESS AND ADMINISTRATION

Charles J. Dirksen, M.S.C., LL.D., *Dean*

Method of Instruction

Students learn through doing. Cases, problems, and discussions supplement in large measure the lecture method.

The students must serve as active participants in class discussions. They must learn how to analyze business problems in a great variety of situations. In so doing, they develop the ability and aptitude to evaluate a business problem and to decide on what course of action to follow.

Undergraduate Program

The program leading to a degree of Bachelor of Science in Commerce consists of a total of 40 term courses (175 quarter units). To fulfill the residence requirement, at least seven term courses must be taken normally in the year immediately preceding the awarding of the Bachelor's degree. Transfer students who attend the University only in their senior year shall complete nine term courses as a residence requirement.

During the first two years, extreme specialization is not the aim of the school. Rather, the student is trained in the fundamentals of English, mathematics, economics, accounting, and philosophy so that he will be well prepared to analyze and study the technical and special problems of business.

During the junior and senior years, the program is arranged so that every student will include courses in the major functions found in typical business firms.

Special and advanced work is given in accounting, administration, economics, finance, management, marketing, and quantitative methods, so that students may specialize in some specific area. As an example, majors in accounting may take the required work to prepare for the Certified Public Accounting examination.

Honors Program

During the freshman and sophomore years a limited number of students will be assigned to honors sections which will be offered for students in the School of Business and in the Colleges of Humanities and Sciences. During the junior and senior years, a limited number of special honors sections will be supervised by the various departments in the School of Business.

In order to qualify for the Honors Program, students in the School of Business must rank in the upper ten percent of the class in which they are enrolled and be accepted by the University Honors Committee.

Internship Program

The Undergraduate Committee of the School of Business and Administration will grant permission for a limited number of students to earn five quarter units of credit in a special internship program.

To qualify for the course credit, the student will be required to make arrangements with an executive of a business firm or governmental unit to supervise the work or project.

The student must then submit a written petition to the Undergraduate Committee. The petition must include a detailed plan of study and a written statement from the executive of the organization stating that he will accept the responsibility of supervising the work or project.

The Undergraduate Committee of the School will decide whether or not the petition for the work will be approved.

SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF ACCOUNTING

John Pagani, Ph.D., *Chairman*

Professors: Thomas Maier, John Pagani
Associate Professor: Charles F. Louie
Assistant Professors: Marlynn K. Bohman, Paul V. Harrell, Denzill Causey
Lecturers: Norman L. Amy, Louis F. Boitano

Required: 130, 131, 132, 133 plus any other accounting course. Those preparing for professional accounting careers should include 134, 135, 137 and 138. One course in Business Law is required.

1. FUNDAMENTALS OF ACCOUNTING

Constructive aspects of accounting with attention centered on the general ledger and its manipulation.

2. FUNDAMENTALS OF ACCOUNTING

The financial cycle and its interpretation as seen through accounts. Prerequisite: 1.

3. FUNDAMENTALS OF ACCOUNTING

Managerial accounting as viewed through the analysis of costs. Prerequisite: 2.

55. ACCOUNTING IN THE SOCIAL SCIENCES

The analytical framework of accounting with reference to the social sciences.

130. ACCOUNTING PRINCIPLES I

Valuation in financial accounting. Prerequisite: 2.

131. ACCOUNTING PRINCIPLES II

Valuation in financial accounting. Prerequisite: 130.

132. ACCOUNTING PRINCIPLES III

Accounting for proprietory interests. Prerequisite: 131.

133. ACCOUNTING PRINCIPLES IV

Accounting for proprietory interests. Prerequisite: 132.

134. ACCOUNTING ANALYSIS

Interpretation of accounts in terms of funds and costs. Prerequisite: 3.

135. ACCOUNTING PROBLEMS

Analysis of complex accounting problems. Prerequisite: 132.

136. COST ANALYSIS

Standard costs and budgetary techniques for cost control. Cost and profit analyses for decision-making purposes, including direct costing, profit-volume analysis, and break-even analysis. Prerequisite: 3.

137. AUDITING

The techniques of external auditing, which are based upon the purpose of an audit and upon the conventional standards to which these techniques should conform.

138. INCOME TAXATION I

Federal income tax practice and theory applied to the determination of tax liability of the individual. Similarities and differences, when appropriate, are indicated for partnerships and corporations.

139. INCOME TAXATION II

Federal income tax theory and practice applied to the determination of tax liability of corporations, partnerships, estates, trusts, and gifts.

191. INTERNSHIP

Opportunity for selected upper division students to work in local governmental units or firms. Prerequisite: Upper division standing and approval of the Undergraduate Committee.

198. INDEPENDENT STUDY

199. UNDERGRADUATE RESEARCH PAPER

SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF ECONOMICS

Mario L. Belotti, Ph.D., *Chairman*

Professors: Mario L. Belotti, Thaddeus J. Whalen, Jr.
Associate Professor: John Heineke
Assistant Professors: Richard T. Coz, S.J., Henry G. Demmert, D. Dick, William F. Donnelly, S.J., Gebhard Long, R. Looney, Marshall Medhoff
Lecturer: J. Bohman

Required: Economics 110, 114, 115 plus a minimum of five other courses in Economics.

Economics 1 and 2, or permission of the instructor, is required for all upper-division courses.

1. PRINCIPLES OF ECONOMICS I

An introduction to the general principles, terminology, and methods of macro-economics.

2. PRINCIPLES OF ECONOMICS II

An introduction to the general principles, terminology, and methods of micro-economics.

12. AMERICAN ECONOMIC HISTORY

A study of the economic history of the United States with special emphasis upon basic economic organizations, such as the business enterprise, the labor union, and the economic functions of government.

15. ENVIRONMENTAL RESOURCES AND INDUSTRIES

This course examines the market solution to resource allocation and then explores market failure with reference to the use of common property environmental resources, air and water. Efficient use of these resources will be examined and mechanisms to arrive at the efficient solution will be analyzed. Prerequisite: Economics 2, or permission of instructor.

20. CURRENT ECONOMIC ISSUES

A study of contemporary economic problems.

55. STATISTICS I

Introduction to statistical methods and techniques of elementary statistical analysis.

101. STATISTICS II

A course designed to acquaint the student with the foundations of statistical research methods. Topics include distribution theory, estimation, testing, and prediction, with special emphasis upon multivariate models. Prerequisites: 22:011 and 22:012 or equivalent.

110. HISTORY OF ECONOMIC THOUGHT

A study of the evolution of economic ideas and their influence on the development of economic practices.

111. MATHEMATICAL ECONOMICS

The formulation of various economic systems in mathematical terms and the deduction of a number of properties of these systems. Prerequisites: Math 11 and 12, or permission of the instructor. Prerequisites: 22:011, 22:012, 13:114 and 13:115, or consent of professor.

112. ECONOMETRICS

The estimation and testing of fundamental economic relationships. Prerequisite: 101 or equivalent.

113. INDUSTRIAL ORGANIZATION

A microanalysis of the structure, conduct, and performance of American industry.

114. MICROECONOMICS I

The formulation and explanation of the theory of output, cost, and product prices and of the theory of the employment of, and returns to, the factors of production.

115. AGGREGATE ECONOMIC THEORY

An analysis of the level of national income and its determinants.

116. ECONOMIC DEVELOPMENT OF THE UNITED STATES

An analysis of the principal factors governing the growth and expansion of the American economy since 1800.

117. ECONOMIC DEVELOPMENT OF EUROPE

A study of the preindustrial environment and industrial growth patterns of the western European countries.

118. COMPARATIVE ECONOMIC SYSTEMS

A comparison of free market economies with other economies.

119. PUBLIC FINANCE

An analysis of public expenditures, public revenues, and public debt with particular emphasis upon their effects on the economy.

120. TAXATION

An analysis of the shifting, incidence, and economic effects of the various forms of taxation. Prerequisite: Economics 114.

121. MICROECONOMICS II

A study of the principles by which economists evaluate the social desirability of alternative market arrangements. Prerequisite: Economics 114.

122. MONEY AND BANKING

A theoretical, institutional, and historical approach to the study of money and banking, with particular emphasis upon the relationship between the monetary and banking system and the rest of the economy.

128. BUSINESS FLUCTUATIONS AND FORECASTING

A study of the nature and causes of economic instability in an industrial economy.

129. ECONOMIC DEVELOPMENT

An analysis of the historical and theoretical context underlying present efforts to increase the rate of economic growth in underdeveloped countries.

130. LATIN AMERICA ECONOMIC DEVELOPMENT

An examination of the economic development of Latin American countries with particular emphasis on the relationships between economic growth and the social, political and economic structures of these countries.

131. AFRICA ECONOMIC DEVELOPMENT

A study of the economic development of Africa, with particular emphasis upon the relationships between economic growth and the social, political and economic structures of these countries.

132. ASIA ECONOMIC DEVELOPMENT

A study of the economic development of Asian countries with particular emphasis upon the relationships between economic growth and the social, political, and economic structures of these countries.

133. SOVIET ECONOMIC DEVELOPMENT

A study of the economic development of the Soviet Union since the Communist Revolution.

134. GROWTH DYNAMICS AND PLANNING

A study of various theoretical growth models and their application to development and planning and project evaluation.

140. URBAN ECONOMICS

This course examines the economics of urban problems with emphasis on location and land use, the housing market, and transportation. The interaction of location and land use decisions with the housing market and the transportation system is analyzed with reference to the amelioation of urban problems. Prerequisite: Economics 114 or permission of instructor.

150. LABOR ECONOMICS

A study of labor productivity, incomes, employment and how these are affected by labor organizations and labor legislation.

160. THE ECONOMICS OF POVERTY

A study of the economic conditions which lead to poverty and possible alternative policies directed at modifying such conditions.

180. INTERNATIONAL ECONOMICS

An analysis of the theory of international trade, of problems in balance of payments adjustments, and of international policies. Prerequisite: Economics 114.

188. JUNIOR SEMINAR

Modern economic theories and problems. Reserved for Honors students.

189. SENIOR SEMINAR

Modern economic theories and problems. Reserved for Honors students.

190. INDEPENDENT STUDY

191. INTERNSHIP

Opportunity for selected upper division students to work in local governmental units or firms. Prerequisite: Upper division standing and approval of the Undergraduate Committee.

SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF FINANCE

D. Robert Papera, Ph.D., *Chairman*

Professors: Francis J. Corrigan, D. Robert Papera
Associate Professor: Pretorius Van Den Dool
Lecturer: Joseph F. X. Monasta

Required: 121, 125, plus four electives from the following: 124, 125, 126, 129, 148, 150, 191, 198, 199, Economics 119, Economics 120.

121. FINANCIAL MANAGEMENT

Primary emphasis on financial analysis, decisions, and policies related to the management of working capital and the sources of short-term financing.

124. INVESTMENTS AND INVESTMENT INSTITUTIONS

Nature of investment institutions and the development of their investment programs in practice and theory.

125. FINANCIAL POLICY

Emphasis placed on financial analysis and theory pertinent to financial structure, capital structure, dividend policy, cost of capital, capital budgeting, and investment policy and valuation.

126. DYNAMICS OF THE FINANCIAL SYSTEM

Role and function of financial institutions, financial flows, interest rate structures, money, and capital markets. The implications for the formulation of business financial policy will be highlighted.

129. SENIOR FINANCE SEMINAR

Students study and discuss selected topics in financial management, theory, and research. The selected topics will be partially determined by interests of the seminar members. Emphasis is placed on discussion of a paper and individual reading.

148. PRINCIPLES OF INSURANCE

A survey course to acquaint the student with the general principles of insurance and their application to the various branches of the field.

150. LIFE INSURANCE

Studies of the theoretical concepts of the business and personal uses of life insurance and annuities.

191. INTERNSHIP

Opportunity for selected upper division students to work in local governmental units or firms. Prerequisite: Upper division standing and approval of the Undergraduate Committee.

198. INDEPENDENT STUDY

199. UNDERGRADUATE RESEARCH PAPER

SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF MANAGEMENT

Joseph M. Trickett, Ph.D., *Chairman*

Professor: Joseph M. Trickett
Visiting Professors: McKee Fisk, H. B. Kirshen
Associate Professor: Warner O. Brandenburg
Assistant Professor: Joel K. Leidecker James Hall
Lecturers: Mylen E. Fitzwater, Arthur Highman, Robert F. Jacobs, Joseph P. Kelly, Leo Spier

Required: 160, 162 plus any three to be selected from 158, 159, 164, 166, 168 and 171, and 191, 198 and 199 and Sociology 147.

11. BUSINESS AND SOCIETY

To discuss and clarify the role of business in modern society and its relationship with the social, political, and economic environments. The course emphasizes the external environment of Business and how these forces are influencing the scope functions and objectives of business institutions.

18. LEGAL ENVIRONMENT OF BUSINESS I

An examination of the law as applied to business and the environment.

20. LEGAL ENVIRONMENT OF BUSINESS II

Continuation of 18.

147. SOCIOLOGY OF MANAGEMENT

Consideration of formal and informal groups and organizations in industry. (This course will not be offered after the academic year 1972-1973.)

158. GOVERNMENT AND BUSINESS

A study of federal and state economic powers and how they have been used to promote and regulate business activity.

159. MANAGEMENT AND THE ARTS

The nature of management and the economic issues and problems concerning individuals and organizations in the fine arts and the performing arts.

160. ORGANIZATION AND MANAGEMENT

The nature and meaning of management work, the major areas of management operation, concepts of organization and their applications, departmental and interdepartmental organization and relationships.

162. BUSINESS POLICIES AND MANAGEMENT

A study of the interrelationship and coordination of prior functional and managerial courses leading to the formulation and administration of policy. Comprehensive cases comprise the basic material. Prerequisite: Senior standing.

164. MATERIALS MANAGEMENT

An integrated study of the material flow within an industrial firm, including the interaction of material flow with "order" and information flows.

166. PERSONNEL ADMINISTRATION

An intensive review of the role and functions of the personnel department in business organizations, with particular emphasis on selection and placement, training and development, and union-management relations.

168. MANAGEMENT OF HUMAN RESOURCES

Concepts to foster the effective utilization of human resources within the business organization—human behavior and job performance, motivation theory, interpersonal and group relationships, the management of conflict and change.

171. INDUSTRIAL PSYCHOLOGY

Psychological fundamentals affecting individual and group behavior in organizational situations.

191. INTERNSHIP

Opportunity for selected upper division students to work in local governmental units or firms. Prerequisite: Upper division standing and approval of the Undergraduate Committee.

198. INDEPENDENT STUDY

199. UNDERGRADUATE RESEARCH PAPER

SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF MARKETING

Ronald Stucky, Ph.D., *Chairman*

Professors: Paul L. Brown, Charles J. Dirksen, John Ewing, Ronald L. Stucky
Assistant Professor: Albert V. Bruno

Required: 181, 182; plus any three of the following: 165, 167, 179, 183, 184, 185, 189, 191, 198, 199, Economics 180.

165. RETAILING

A study of trends in retailing, and of the forces of competition which constantly introduce dynamic change into retailing. Prerequisite: 181.

167. PURCHASING

The problems of procuring and coordinating a flow of raw materials, parts, and supplies with the needs of production and operation of industrial and commercial organizations. Prerequisite: 181.

179. SMALL BUSINESS ENTREPRENEURSHIP

Evaluating and beginning a new business venture including acquisition of existing enterprises.

181. PRINCIPLES OF MARKETING

An exploration of the nature of marketing, the analysis of marketing institutions, and the relationship between demand and marketing.

182. PRINCIPLES OF MARKETING

A continuation of 181. A study of pricing policies and public regulation of marketing.

183. MARKETING AGRICULTURAL PRODUCTS

A study of the types of agricultural products and their markets; middlemen and their services; price-determining factors; governmental agencies; cooperative marketing.

184. ADVERTISING

An analysis of the marketing psychological and social aspects of advertising. Prerequisite: 181.

185. SALES MANAGEMENT

An exploration of the systematic management of marketing activities, including the coordination of production and sales, product planning, and the administration of sales forces. Prerequisite: 181.

189. MARKETING RESEARCH

A study of the application of marketing research methodology to the solution of business problems and of the survey method as used in marketing research. Prerequisites: 181, 182 and Senior standing.

191. INTERNSHIP

Opportunity for selected upper division students to work in local governmental units or firms. Prerequisite: Upper division standing and approval of the Undergraduate Committee.

198. INDEPENDENT STUDY

199. UNDERGRADUATE RESEARCH PAPER

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SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF QUANTITATIVE METHODS

Zeb L. Vancura, Drs. (Econ.), *Chairman*

Professor: Chaiho Kim
Associate Professor: Zeb L. Vancura
Assistant Professors: B. Ballard Cheatham, Jin Y. Yen, S. Parikh
Acting Assistant Professors: S. Y. Tsai, N. Pohl
Lecturer: Mikes SiSois

Required: 100, plus any four of the following: 101, 102, 103; Economics 111, 112. Mathematics 21, 53.

13. INTRODUCTORY MATHEMATICS

College algebra and trigonometry.

14. MATHEMATICAL CONCEPTS I

Analytical geometry and calculus.

15. MATHEMATICAL CONCEPTS II

Continuation of 14.

16. MATHEMATICAL CONCEPTS III

Finite mathematics.

40. STATISTICS

Basic concepts and methods of statistics, including probability, descriptive statistics, significance tests, estimation, sampling and correlation.

100. QUANTITATIVE METHODS I

An introduction to the application of mathematical models and techniques to problems of business and operations management. Prerequisite: 40 or equivalent.

101. QUANTITATIVE METHODS II

The principles of statistical inference, including statistical estimation, significance tests, correlation and regression, and analysis of variance. Prerequisite: 40 or equivalent.

102. QUANTITATIVE METHODS III

Operations research models used in the solution of business and economic problems. Prerequisite: 100 or equivalent.

103. QUANTITATIVE METHODS IV

Further discussion of models of operations research and management science. Prerequisite: 102.

191. INTERNSHIP

Opportunity for selected upper division students to work in local governmental units or firms. Prerequisite: Upper division standing and approval of the Undergraduate Committee.

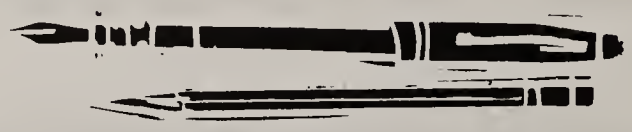
SCHOOL OF ENGINEERING

Robert Parden, Ph.D., *Dean*

DEGREES

The undergraduate programs lead to Bachelor of Science degrees in Civil, Electrical and Mechanical Engineering and a more general program for the Bachelor of Science in Engineering degree. At the Master of Science level, degrees may be earned in Civil and Mechanical Engineering, Electrical Engineering and Computer Science, Engineering Mechanics, Applied Mathematics, and Engineering.

The Engineer's degree, which represents a year of study beyond the Master's degree, may be earned in Electrical Engineering, Computer Science, Mechanical Engineering, and in Engineering Mechanics. The Doctor of Philosophy degree is granted in Electrical Engineering.



ALLIED OCCUPATIONS

To be able to narrow one's interest in a career to a specific program, such as Engineering, it is necessary to recognize other kinds of assignments whose preparation follows different formal avenues from that of Engineering. For example:

The Scientist is interested in basic relationships and has an intense curiosity about nature. His discoveries are the raw material for the engineer's applications. A career in science normally is associated with the work of a physicist, the chemist, the biologist, and other assignments in basic science. The preparation for these careers differs from that of the engineer.

The Mathematician is concerned primarily with mathematics as precise description and with construction of mathematical models of physical situations. His contribution to engineering is interpretation, prediction, and application of generalized expressions to specific situations. Here, again, the work of the mathematician and the engineer overlap considerably. Many kinds of engineering assignments require a considerable sophistication in mathematics. It is in the concern for applications that the attitude of the engineer and the mathematician differ. The mathematician may often be more interested in mathematics as a science than he is in applications which might utilize mathematics.

The Technician is one of the men who works with engineers. His interest is practical, and generally he does not need the same amount or kind of formal education. Primarily his job is to gather data and assemble accumulated experience for application to specific and sometimes, repetitive problems.

The Mechanician or Craftsman is concerned with shaping or forming raw materials into useful forms. He fabricates parts, assembles machines, often installs, tests, and maintains equipment. His preparation normally involves the development of a high degree of manual skill.

SCHOOL OF ENGINEERING
TECHNOLOGY AND MODERN LIFE

—A Series of Courses Presented by the School of Engineering—
Open To All Students In The University

It has been proposed that man is losing control of his destiny because of rapid advances in technology. Local transportation systems are inadequate, costly, inconvenient or contribute to pollution. Power generation and distribution disturbs the landscape and creates air and water pollution. The computer is identified with the growing complexity of conducting our daily lives.

Technology has also strongly influenced communications, so that we are able to see and to be seen, instantly, around the world and in space. It has changed campaigning, and the reporting of prices in world markets. Our recreational patterns are changed by equipment, ground and air travel. Technology has an impact on every facet of our lives.

The impace of technology will not lessen in the future, it will accelerate. However, the nature of the impact can be altered. It will be altered as a greater number of people gain knowledge of the complex system within which technological, social, economic and political choices take place, and the impact of one choice upon the other.

The courses listed below, are organized to systematically explore the interaction of technology and the environment. In addition, these courses will be presented in such a manner that the individual can reinforce his current interests, or further explore those parts of the system, our world, with which he might become involved in the future. Guest speakers and field trips, projects and term papers will facilitate this understanding.

1. ENERGY AND THE WORLD'S RESOURCES

Man needs energy to survive. But the misuse of energy may destroy him. Can this dilemma be resolved? How are gas, oil, water, coal, and the sun related to technology and the social, economic and political problems of generating electric energy?

2. CONSUMER AND ENVIRONMENTAL CONCERNS

An examination of consumer products in terms of purpose, performance, safety, resource utilization, and environmental consequences. Students will make a product evaluation as a course project. Legal legislative, and ecological view points will be presented by guest speakers.

3. INTRODUCTION TO COMPUTING

History of computational needs and devices. Algorithmic problem solving, flow charts. Basic computer concepts and organization. Number systems, and data types. Use of small computers and programmable calculators. Programming in high level languages (emphasis on FORTRAN). Introduction to sub programs. Non numeric information and language processing. This course is intended for non engineering students and will include several projects which explore com-

puter applications in such diverse areas as mathematics and statistics, natural sciences, social sciences, medicine, simulation, games, natural language translation, etc. Prerequisite: High school algebra or equivalent.

4. ELECTRONIC SYSTEMS IN CONTEMPORARY SOCIETY

The operating principles of various systems will be presented: radio, television, audio, telephone and computers. The national and international consequence of the networks they support will be discussed. Kit construction will be utilized.

5. INTRODUCTION TO ENGINEERING

Discussion of significant engineering problems of the present and future. Field trips. Open to all students to familiarize the engineering student with his chosen field and to acquaint the non-engineering student with the engineering profession.

6. ECOLOGY AND POLLUTION

The man-made world and its impact on the environment; ecology, energy of resources and the generation of power, air pollution and water pollution. The fundamental principles in these various areas will be explored and related to critical contemporary problems and issues.

7. THE DYNAMICS OF SAILING

The principles of physics are applied to the art of sailing. Concepts of lift and drag, relative motion and meterology are studied and related to the techniques and tactics of sailing.

8. VISUAL THINKING

The integration of student's imagination with their knowledge of materials and the forces which shape them. Intensive involvement in exercises and projects to expand creative abilities. Presented jointly by the engineering and arts faculty.

9. ART AND TECHNOLOGY

A survey of contemporary technology and science and their influence and application in art. Areas covered include systems, computers, structures and materials, dynamics and vibrations, electromagnetics, holography, and television. Prerequisite: 6, Visual Thinking, or permission of the instructor.

10. DESIGN

Principles of orthographic projection and descriptive geometry. Graphic analysis of lines, surface areas and volumes. Methods and solutions for simple design problems are presented.

11. GEOLOGY AND HYDROLOGY

Development and formation of geologic materials. Engineering significance of structure, land form, erosion, deposition. Stream and shoreline processes. Surface and subsurface water. Laboratory. Prerequisite: Sophomore standing.

12. DESIGN OF RESIDENTIAL DWELLINGS

Properties of materials of construction and design of residential dwellings making use of Uniform Building Code and other design data books. Two lectures

and one three hour laboratory per week and field trips. This course is open to sophomore, junior or senior engineering students with permission of the instructor.

15. INTRODUCTION TO THE PRINCIPLES AND APPLICATIONS OF DIGITAL COMPUTER SYSTEMS

History of computational needs and devices. Algorithmic procedures for problem solving; iteration; recursion. Basic concepts and organization of stored-program digital computers. Computer solution of problems. Programming methods and languages. Number systems and digital data representation. Use of machine languages and programmable calculators. Programming in high-level languages (emphasis on FORTRAN). Subprogram organization and use. Processing of non-numeric information. Introduction to computer hardware functions. Prerequisite: High school algebra.

16. SYSTEMS CONCEPTS I

Fundamentals of technical, economic, environmental and political problems created by a rapidly growing technology in society. Concepts of modeling, optimization and tradeoffs.

17. SYSTEMS CONCEPTS II—THE ENVIRONMENT

Examination of the environment as a system. Values which motivate mankind to create technology. Areas of conflict and resolution between basic human values and technological society.

18. SYSTEMS CONCEPTS III—SELECTING DESIGN PARAMETERS

Economic and political evaluation of engineering alternatives.

19. SYSTEMS CONCEPTS IV—SOCIAL SYSTEMS

The social systems in which engineering takes place. National, state and urban governments, industrial organizations. Planning, decision making and funding.

41. MECHANICS I

Resolution and Composition of force systems and equilibrium of force systems acting on structures and mechanisms. Introduction to stress and strain analysis. Laboratory. Prerequisite: Physics 4.

42. MECHANICS II

Dynamics of a particle and dynamic of rigid bodies. Introduction to theory of vibrations. Laboratory. Prerequisite: Mechanics I.

43. MECHANICS III

Analysis of stresses and strains in bodies undergoing various loading conditions. Energy theorems and their applications. Laboratory. Prerequisite: Mechanics I.

60. MATHEMATICAL TOOLS IN ENGINEERING

Trigonometry, analytic geometry, and calculus, and their use in solving engineering problems. Emphasis is on the relation of the mathematical method to the engineering problem.

61. MORE USES OF MATHEMATICS

Matrices, difference and differential equations, and operating mathematics.

62. EQUILIBRIUM MECHANICS

Force systems and their resultants. Identification and isolation of systems in equilibrium. Mathematical descriptions of these systems using vector algebra and calculus. Properties of materials as they influence the state of equilibrium. Topics selected from the traditional subjects of statics and strength of materials.

63. NONEQUILIBRIUM MECHANICS

Kinematics—the description of motion—emphasizing the formulation of mathematical descriptions rather than the memorization of formulas. Kinetics—force-motion relationships: Newton's laws of motion, impulse momentum methods, energy methods. Relative motion.

64. ELECTRIC CIRCUITS

Review of basic electric devices and their characteristics. Kirchhoff's voltage and current laws. DC circuit analysis: Network loop and node equations and their matrix formulation. Energy storage elements and transient response. Introduction to state space techniques. Steady-state AC circuit analysis. Introduction to frequency-domain techniques. Introduction to electromagnetics and electromechanics.

65. ELECTRONIC CIRCUITS

Semiconductor principles and the pn junction. Operation and models of diodes and bipolar and field-effect transistors. Linear small-signal models and analysis of solid-state amplifiers. Introduction to integrated circuits. Use and analysis of circuits employing feedback. Use of operational amplifiers. Introduction to stability analysis. Oscillators. Overview of non-linear electronics. Simplified large-signal models of diodes and transistors. Introduction to pulse, timing and digital circuits. Survey of principles and applications of special-purpose semiconductors (tunnel diodes, unijunction transistors, thyristors, etc.).

66. ELECTRIC AND MAGNETIC FIELDS

The fundamental relations which govern all electric and magnetic devices are explored. Theory and application are closely linked.

67. THERMODYNAMIC LAWS AND PROPERTIES

Equilibrium and the surface of state. Processes. Work, heat, and the first law of thermodynamics. Internal energy, enthalpy, specific heats. Reversibility and the second law of thermodynamics. Entropy and available energy. Open and closed system analyses.

68. THE MOTION OF FLUIDS

Velocity fields and the continuity principle. Euler's and Bernoulli's equations. Characteristics of real fluid flow. Dimensional analysis. One dimensional analysis of real fluid flow. The momentum principle.

136. SYSTEMS ENGINEERING CONCEPTS V—Transportation

Modes of transportation are examined in terms of energy, economic, social and political factors with the purpose of improving design awareness.

150. SYSTEMS ENGINEERING CONCEPTS VI—Optimization

Definition of the systems engineering process and its interface with operations research. Emphasis placed upon those mathematical optimization techniques and those probability theory concepts which find application during the design, development, and evaluation of systems.

155. SYNTHESIS OF ENGINEERING SYSTEMS

The logic and quantatative tools of synthesizing engineering systems. Needs and environmental analysis leading to constraints specifications, design concepts and design criteria.

197. DIRECTED READING

For students who wish to do intensive reading in areas not emphasized in course work.

SCHOOL OF ENGINEERING
APPLIED MATHEMATICS PROGRAM

Gerald Markle, Ph.D., *Coordinator*

Professor: Gerald Markle
Lecturers: Charles H. Chicks, Raul J. Conti, Wade H. Foy, Henry D. Friedman, William T. Hatley, Charles M. Hogan, Edward R. Meyer, Paul O. Scheibe, Jerome G. Sowul

The Applied Mathematics faculty is composed of members of several University departments, including Mathematics, Engineering, Chemistry, and Physics. With the exception of the three courses below, most of the Applied Mathematics Program is designed for graduate study. A complete listing of the offerings may be found in the Bulletin of *Graduate Courses and Degrees of the School of Engineering.*

106. DIFFERENTIAL EQUATIONS

First-order linear differential equations, systems of linear differential equations, homogeneous systems of linear differential equations with constant coefficients, the Laplace transform, the solution of differential equations by Laplace transform. Prerequisite: Mathematics 21.

108. PROBABILITY AND STATISTICS

Definitions of probability, sets, sample spaces, conditional and total probability, random variables, distributions, functions of random variables, sampling, estimation of parameters, testing hypotheses.

112. INTRODUCTION TO PROBABILITY THEORY

Definitions, sets, conditional and total probability, the binomial distribution approximations, random variables, important probability distributions, functions of random variables, moments, characteristic functions, joint probability distributions, marginal distributions, sums of random variables-convolutions, correlation, sequences of random variables, limit theorems.

118. NUMERICAL METHODS

Fortran programming concepts. Numerical solution of algebraic and transcendental equations, finite differences, numerical differentiation and integration, and solution of ordinary differential equations. Solution of representative problems on the digital computer.

SCHOOL OF ENGINEERING
CIVIL ENGINEERING AND ENGINEERING MECHANICS

Henry V. Hahne, Ph.D., *Chairman*

Professors: Henry V. Hahne, A Morgan Johnson
Associate Professor: Harold M. Tapay

Lecturers: Charles Battersby, Norman A. Cyr, Robert Farnquist, Thomas J. Gribben, David Hartley, Richard Hughes, Anastasy M. Israilov. Farnum Kerr, Robert Lawrence, William J. Miller, Wilmot J. Nicholson, John O'Halloran, Bernard Ross, William Rugg, Olney Smith, Hilary Theisen, Jack Watkins, Jr., Jeremy Wire

Civil Engineering encompasses the fields of Transportation Engineering, Water Resources Engineering, Soils Engineering, and Structural Engineering.

Transportation Engineering relates to the planning, design, and construction of highways, airports, railroads and waterways, and specialized facilities such as tunnels, canals and canal locks, and harbor structures.

Water Resources Engineering deals with the utilization of water resources such as surface and ground waters, water supply and distribution, sewage collection and disposal, treatment methods, and flood control and irrigation projects.

Soils Engineering treats with the use of soils as engineering materials, including applications to pavements, building foundations, and earth structures.

Structural Engineering relates to structures such as bridges, industrial and commercial buildings, and various special purpose structures.

Municipal and Public Works Engineering is a field of application of principles of engineering mechanics, transportation, water resources, structures, and soils to the planning and administration of public engineering works.

10. SURVEYING

Survey instruments—their use, and care. Principles of topographic mapping, linear measurements, leveling traverses, curves, earthwork, boundary and public surveys. Field practice.

20. GEOLOGY AND HYDROLOGY

Development and formation of geologic materials. Significance of structure, land form, erosion, deposition. Stream and shoreline processes. Surface and subsurface water. Laboratory. Prerequisite: Sophomore standing.

115. MATERIALS ENGINEERING

Origin, manufacture, and processing of materials used in civil engineering. Significant properties of metals, wood, cement, and other engineering materials. Corrosion and its prevention. Fire resistance.

118. CONSTRUCTION ENGINEERING I

Licensing. Drawings and specifications. Cost Analysis, estimating and bidding. Contracts. Bonds. Financing. Insurance. Labor Legislation. Planning and scheduling.

121. SOILS ENGINEERING

Origin, development and properties of soils. Classification of soils and applica-

tions of physics and engineering mechanics to soil as an engineering material. Water in soils. Compaction, stabilization, consolidation and bearing capacity. Laboratory. Prerequisites: 20 and E43.

130. STRUCTURAL ANALYSIS I

Analysis of stresses in statically determinate structures under stationary loads. Roof and bridge trusses. Straight and curved beams. Frames. Three-hinged arches. Influence lines for beams. Prerequisite: E43.

131. STRUCTURAL ANALYSIS II

Influence lines for bridge trusses and simple arches. Analysis of deformations of structures. Introduction to statically indeterminate structures and the analysis of building frames using moment-distribution method. Introduction to plastic analysis. Prerequisite: 130.

133. STRUCTURAL STEEL DESIGN

Riveted and welded connections. Tension and compression members. Floor systems and roof trusses. Detailing and shop practice. Industrial buildings. Bridges. Prerequisite: 130.

135. REINFORCED CONCRETE DESIGN

Analysis and design of reinforced concrete structures. Introduction to elementary concepts of plastic theory and the theory of pre-stressed concrete. Concrete mixes and construction methods. Prerequisite: 130.

136. ADVANCED CONCRETE DESIGN

Theory and practice of the design of office, apartment and industrial buildings. Design of highway bridges. Concrete arches. Design of prestressed concrete structures. Prerequisite: 135.

137. FUNDAMENTALS OF EARTHQUAKE ENGINEERING

Causes of Earthquakes, Magnitude of Earthquakes, Ground Motion and its measurement. Response of Structures to Earthquakes and Design of Earthquake-Resistant Structures.

138. ADVANCED SOILS AND FOUNDATIONS

Surveying, mapping, and foundation exploration; slope stability and settlement analysis; spread foundations; piles and caissons; earth-retaining structures; loads on underground conduits; subsurface construction. Prerequisites: 121 and 135.

140. WATER RESOURCES ENGINEERING

Concepts of various aspects of water resources: storm and flood waters, ground waters, water supply and distribution, sewage collection and disposal, and irrigation. Interrelationship of all aspects. Importance of water resources to the environment. Concepts of planning facilities as related to the total needs of the community. Prerequisites: CE 20 and ME 120.

141. HYDRAULIC ENGINEERING

Principles of hydraulics; closed conduit and open channel flow; transitions and structures; culverts; sedimentation and tractive resistance. Prerequisite: ME 120.

142. WATER RESOURCES DESIGN

Design of storage facilities, water distribution systems, storm and sanitary sewer systems, treatment plants, and swimming pools. Prerequisites: ME 120 and CE 135.

143. ENVIRONMENTAL ENGINEERING

Public control of water-born and air-born diseases; vector and weed control; pesticides; food protection. Management of solid wastes; air pollution control; water quality control. Recreational facilities and the residential environment. Planning, organizing, and managing environmental programs. Prerequisites: Biology 9 or Chemistry 2 or equivalent; junior or senior status.

144. ENVIRONMENTAL PLANNING

Physical and esthetic features of the environment and their influence on planning. Soil, geologic, and flooding hazards. Preservation of open space and amenities. Air quality; water quality, congestion. Applications to project planning. Prerequisite: Junior or senior status.

145. TRANSPORTATION ENGINEERING

Transportation as a system to meet the needs of society in movement of people and goods. Interaction between transportation facilities and the community. Engineering aspects of rail, highway, air and water carriers and routes. Modern concepts and technology.

146. URBAN AND REGIONAL PLANNING

Principles of city and regional planning. Organization and functioning of planning agencies. Urban and regional problems and their influence on planning. Features of general plans. Prerequisite: Junior or senior status.

147. PAVEMENT DESIGN

Geometric and structural design of the highway. Urban street layout and details. Layout and design of airport runways, taxi-ways and airports. Railway track and track and roadbed. Pacing materials. Prerequisites: 121 and 145.

148. CONSTRUCTION ENGINEERING II

Construction methods and equipment. Legal aspects of construction. Construction site organization. Prerequisites: 133 and 135.

190. INDEPENDENT RESEARCH

Open to Departmental Scholars only.

191. OFF-CAMPUS PRACTICUM

Open to qualified seniors. The student spends a full quarter off campus as an intern in an agency of the student's choice. He is assigned to a major supervisor

who directs the student in a program of activities which give him a thorough exposure to the functioning of the organization. Frequent conferences are held with a faculty advisor and the student reports on his quarter's work.

199. INDEPENDENT STUDY

Open to Departmental Scholars only.

SCHOOL OF ENGINEERING

ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

Shu-Park Chan, Ph.D., *Chairman*

Professors: Shu-Park Chan, Dragoslav D. Siljak
Associate Professors: Timothy J. Healy, Henry P. Nettesheim, Jack A. Peterson, Raymond B. Yarbrough
Assistant Professors: Frederick W. Clegg, William R. Dunn, Jr.
Lecturers: Jack Armstrong, John Bingham, J. D. Bruce, Hans Camenzind, Edward Chen, Wei Chen, John Choma, George Condas, Alan Grebene, Frank Greene, Michael Kelly, Gary Kelson, Richard Koralek, Tuk Hop Lee, Robert Linebarger, Ralph Love, Anthony Lukes, Dale Lumb, Gilbert Masters, John McConnell, Sanjit Mitra, Edward Snow, Lloyd Taylor, George Thaler, Frank Tung, Thomas Whitney, and Albert Yu

Electrical Engineering and Computer Science includes the design, construction, and operation of equipment for generation, transmission, and utilization of electrical energy. Electrical engineers and computer scientists are concerned with all phases of the electrical transmission of information such as radio, television, and telephone. Data processing equipment and computers used by business, industry, and government are included in their major area of interest. Much of the equipment used in maintaining our national security is powered and controlled by electric and electronic mechanisms.

The computer science program (which includes Engineering 15, EECS 22, EECS 121, and EECS 122) permits undergraduates in Engineering, as well as other schools of the University, to take courses dealing with various aspects of computer science during all four years of their baccalaureate program. Students wishing to acquire an even more extensive background in computer science may make special arrangements to take graduate computer science courses, as well.

The Computer Science program is supported by the facilities of the University Computing Center and the Digital Systems Laboratory. The principal computer for academic functions in the Computing Center is an IBM 1130. An IBM 360 Model 25, used primarily for administrative data processing, is also available. The Digital Systems Laboratory provides complete facilities for experiments and projects ranging in complexity from a few digital integrated circuits and other electronic components to complete computer systems. A unique feature of the Laboratory is the availability of take-home "breadboard" facilities which permit students to design, construct, and test any sort of digital module or system using the most modern integrated circuits available at home, in the dorm, or even at a ski lodge. The laboratory also contains two small general purpose computers manufactured by Digital Equipment Corporation, a PDP-5

and a LINC-8, provided with special equipment designed and built at the Laboratory to facilitate easier student experimentation with these computers.

3. INTRODUCTION TO COMPUTING

History of computational needs and devices. Algorithmic problem-solving; flow charts. Basic computer concepts and organization. Number systems and data types. Use of small computers and programmable calculators. Programming in high-level languages (emphasis on FORTRAN). Introduction to subprograms. Non-numeric information and language processing. This course is intended for non-engineering students and will include several projects which explore computer applications in such diverse areas as mathematics and statistics, natural sciences, social sciences, medicines, simulation, games, natural language translation, etc. Prerequisite: high school algebra or equivalent.

22. INTRODUCTION TO COMPUTER AND DATA STRUCTURES

Covers, to a greater extent than is possible in Engineering 15, some of the most important details of computer systems and their use. The student explores the major modules of typical computers and their interaction. Arithmetic, control, memory, and input/output functions are examined in depth from the point of view of the computer user. General characteristics of machine-level languages are presented and the student gets a chance to practice assembler language programming on a general purpose computer. In addition, major types of data structures used in the organization of information for computer processing are introduced and standard techniques for their manipulation are explored.

101. PRINCIPLES OF ELECTRICAL ENGINEERING I

Parameters of electrical components, introduction to circuit theory, principles of electromechanical energy conversion, transient and steady-state behavior of electrical systems. Laboratory. Prerequisites: Physics 6 or 10, Mathematics 21.

102. PRINCIPLES OF ELECTRICAL ENGINEERING II

A continuation of 101 to include the basic principles of energy conversion. Introduction of the basic principles of electronics. Elementary theory of vacuum, gas, and solid state electronic devices. Applications to basic electronic circuits as used in communications and industrial electronic systems. Laboratory.

103. ELECTRICAL INSTRUMENTATION AND CONTROL

Introduction to system theory analysis, determination of models for electromechanical and electronic equipment. Analytical techniques for both open- and closed-loop control systems. For non-Electrical Engineering majors. Laboratory. Prerequisite: 101.

104. FUNDAMENTALS OF ELECTROMAGNETIC FIELDS

Static electric and magnetic fields, dielectric and magnetic materials. Time-varying fields. Transmission line theory. Introduction to antennas and propagation. Prerequisite: 101.

108. MICROWAVE THEORY AND TECHNIQUES

A combined lecture and laboratory course covering generation, propagation, and detection of microwave energy. Experiments on klystrons, impedance measurements, antenna radiation patterns, and the characteristics of passive microwave devices. Laboratory. Prerequisite: 104.

111. MATRIX ANALYSIS OF NETWORKS AND SYSTEMS

Review of matrix algebra, elementary network topology, matrix formulation of system equations, network theorems, Laplace transform techniques, sinusoidal steady-state analysis, frequency response plots, two-port network theory, active two-port devices, state-space analysis methods, computer-aided analysis.

112. MODERN NETWORK SYNTHESIS AND DESIGN

Approximation. Synthesis of passive and active networks. Sensitivity and tolerance analysis. Computer techniques for network designs using optimization. Prerequisite: EE 111.

121. INTRODUCTION TO DIGITAL SYSTEMS

Basic switching concepts. The concept of logical signals. Survey of digital logic circuits including MSI circuits. Number systems. Digital representation of information. Boolean algebra, its properties, and uses. Canonical forms for Boolean expressions. Switching network description. Minimization techniques for switching functions. Means of obtaining memory in digital circuits. Asynchronous sequential circuit analysis and design. Timing problems: races and hazards, their causes, consequences, and cures. Use of flip-flops and synchronous sequential circuits. Survey of common synchronous sequential circuits, shift registers, counters, etc. Introduction to digital computer organization. Prerequisite: EE 102 or equivalent.

122. COMPUTER SYSTEM DESIGN AND COMPUTER LANGUAGES

Addresses the task of integrating large numbers of digital modules and subsystems into a complete computing system. Various schemes of computer organization are discussed in detail. Uses of electronic, magnetic, and other types of memory systems are examined and compared. Techniques for coordinating the many activities which occur in computing systems are studied. In the second half of the course, the theory and detailed characteristics of artificial languages to facilitate man-computer communications are investigated. Compilers and other systems for computer translation of such languages are explored and their design and use practiced by the student.

131. CONTROL SYSTEMS

Detailed considerations of the mathematical theory of linear feedback control systems. Topics include: transfer functions, relation between time and frequency domain characteristics; analysis and design, using root locus concepts and frequency response plots; performance criteria and sensitivity; stability. Laboratory.

141. COMMUNICATIONS SYSTEMS

Signal description. Fourier transforms, filtering, Hilbert transforms, noise description, linear modulation and demodulation, sponential modulation and demodulation, pulse modulation, information theory. Prerequisite: 151.

151. ELECTRONICS I

Electron ballistics, emission theory, semiconductor theory. Extension of the study of electronic amplifiers to include wideband and radio frequency amplifiers, and the principles and applications of feedback. Laboratory. Prerequisites: 102, 111.

152. ELECTRONICS II

Continuation of 151 to develop features of high-frequency power amplifiers, oscillators, modulation systems. Communications systems. Introduction to nonlinear electronic circuits. Laboratory. Prerequisie: 151.

161. ELECTROMECHANICAL ENERGY CONVERSION

Introduction to energy conversion equations and applications to transducers, rotating amplifiers. Machine dynamics, transfer function realization, and modeling of physical electromechanical systems. Laboratory. Prerequisite: 102.

190. UNDERGRADUATE RESEARCH

Open to Departmental Scholars only.

198. SENIOR THESIS AND SEMINAR

Investigation of an approved electrical engineering problem and preparation of suitable thesis covering the investigation. Conferences as required. The seminar will be presented by the student during the term, covering suitable topics.

199. INDEPENDENT STUDY

Open to Departmental Scholars only.

SCHOOL OF ENGINEERING
MECHANICAL ENGINEERING

Richard K. Pefley, M.E., *Chairman*

Professors: Richard K. Pefley, Michel A. Saad
Associate Professors: R. Ian Murray, Stein Weissenberger, Eugene J. Fisher
Visiting Associate Professor: Dah Yu Cheng
Lecturers: Peter G. Aline, Robert F. Burt, George G. Herzl, Mamoru Inouye, Norman G. Kulgein, Frank E. Talke, Clyde E. Taylor, John R. Viegas, Marcel Vinokur, Roger K. Wedel

Mechanical engineering efforts are devoted to dynamic machinery ranging from jet aircraft and spacecraft to include artificial human organs. Without guidance and control, energy for motivation, and proper materials, these machines would be useless.

Thus energy conversion, material science, fluid flow, and guidance and control schemes come under the purview of mechanical engineers.

Because of the wealth of creation in engineering systems, it becomes imperative that engineers have a broad awareness of the possible consequences of their creative schemes. This awareness is being increasingly emphasized throughout the mechanical engineering program.

15. MATERIAL SCIENCE AND MANUFACTURING PROCESSES

Physical basis of the electrical, mechanical, and thermal behavior of solids. Relations between structural and physical properties. Theory of dislocations, vacancies, and other defects and their effect on physical properties. Illustrations of the relationship between material selection, manufacturing processes and design. Laboratory. Prerequisite: Physics 6.

110. MACHINE DESIGN I

Analytical and graphical analysis of linkages utilizing statics, dynamics, and strength of materials. Machine elements studied include electromechanical and pneumatic-hydraulic components. Prerequisites: 10 and Civil Engineering 116.

111. MACHINE DESIGN II

Continuation of 110. System analysis and synthesis including control systems. Solutions to design problems are critically evaluated by employing case studies.

112. ADVANCED MACHINE DESIGN

Continuation of Machine Design II. Emphasis is placed on design projects. Integration of various components into a complete machine is studied. Prerequisite: ME 111.

120. THERMOFLUID MECHANICS I

Consideration of thermal and fluid properties of matter, Newton's laws of motion, and the laws of thermodynamics. Emphasis is placed on the application of these principles to the analysis of fluid systems. Laboratory work emphasizes dimensional analysis as a guide to experimental studies of fluid flow. Prerequisite: Engineering 42.

121. THERMOFLUID MECHANICS II

Continuation of 120. Emphasis is placed on control volume analyses of thermofluid systems and on the implications of the second law of thermodynamics for such systems. Laboratory work stresses evaluation of system performance. Prerequisite: 120.

123. GAS DYNAMICS

Introduction to one-dimensional compressible flow of gases, isentropic flow, normal shock waves, frictional flow and adiabatic flow. Prerequisite: 121.

125. THERMODYNAMICS

Thermodynamic potentials and availability concepts. Nonreactive mixtures. Reactive mixtures with emphasis on the thermodynamics of combustion and chemical equilibrium. Prerequisite: 121.

135. HEAT TRANSFER

Introduction to the concepts of conduction, convection, and radiation heat transfer, and application of these concepts to engineering problems. Prerequisite: 121.

136. PROPULSION SYSTEMS

Common parameters for evaluation of marine, terrestrial, and space propulsion systems. Description and analysis of various types of propulsion systems. Prerequisite: 123.

138. NUCLEAR REACTORS

Introduction to principles underlying nuclear power reactor design. Senior standing required.

140. ADVANCED DYNAMICS

Derivation and solution of equations of motion of linear dynamic systems. Stability, introduction to feedback control systems, vibration and noise. Prerequisite: Engineering 42.

142. FLUID MECHANICS I

Introduction to gas dynamics. Concepts of lift and drag. Mechanics of laminar and turbulent flow. Introduction to boundary-layer theory. Application to selected topics in lubrication theory, aerodynamics, turbomachinery. Prerequisite: 121.

198. THESIS AND SEMINAR

Investigation of an engineering problem and writing of an acceptable thesis. Conferences as required. Prerequisite: Senior standing in Mechanical Engineering.

199. INDIVIDUAL STUDY

By special arrangement with the Chairman of the Department. Credit by arrangement.

ETHNIC STUDIES

Cyril E. Edwards, B.S., *Director*

Ethnic Studies provides an educational process through which operational methods are developed for solving contemporary social and human problems. The methodology of the program ranges from objective analysis through the process of intra-encounter. There is a blending of theory with practice through field-work experiences. Since Ethnic Studies utilizes the experiences of groups who do not enjoy the prerogatives accorded to the dominant population in this country, it serves to provide all students with a more accurate and relevant picture of themselves and their progenitors than could otherwise be obtained.

Emphasis will be on the nature of ethnocentric value systems, the role of the individual in maintaining them and their implications for the future. This focus will be sharpened by a study of the ways in which the individual can initiate communication, interaction, understanding and coexistence on a positive humanistic level with ethnic groups other than one's own.

2, 102. RACISM IN AMERICA

An examination of functional racism in contemporary America. The disparity between the ideology and the reality of America, and its impact on the socialization process; institutional and personal racism; the basis of relations between whites and nonwhites; mechanisms for the neutralization of racism. Students will become more conscious of race as a policy issue which must be confronted.

16, 116. POLITICAL AND ECONOMIC DEVELOPMENT IN MODERN AFRICA

An in-depth examination of selected problems in African political and economic development.

20, 120. COMMUNITY-WORK PROJECT

An opportunity for selected students to work in a community-based project.

21, 121. POCHO HERITAGE

A survey course of Pocho literature which traces the development of the Pocho intellect through the study of primary and secondary textual sources; from the early Maya and Inca Empires to the present-day.

22, 122. CONTEMPORARY POCHO LITERATURE: THIRD WORLD PERSPECTIVE

An analysis of Pocho and Third World writers which focuses on selected critical issues of Third World oppression. Novels by Pocho, Black, Asian, and native American authors will be used.

23, 123. POCHO AND CREATIVE WRITING WORKSHOP

The development of principles and techniques of writing Pocho prose and poetry and general creative writing skills.

24, 124. COMPARATIVE BLACK THOUGHT

A comparative analysis of selected writings in Black nationalist thought in America and Africa from the 19th century to the present.

25, 125. PAN-AFRICANISM

A study of the historical development of the Pan-Africanist movement from 1900 to the formation of the Organization of African Unity (OAU). An in-depth study of the OAU.

26, 126. WEST AFRICA: 1800 TO INDEPENDENCE

An analysis of such factors as colonization, European penetration and African resistance, and the slave trade which contributed to the rise of nationalist liberation movements and modern state systems.

28, 128. RACE AND SOCIETY IN AFRICA

An analysis of the struggle of Africans against white minority rule in Southern Africa, e.g., Angola, Mozambique, South Africa, and Guinea-Bissau; with an examination of the historical, political, social, and economic context of the liberation movements.

29, 129. BLACK PERSPECTIVES

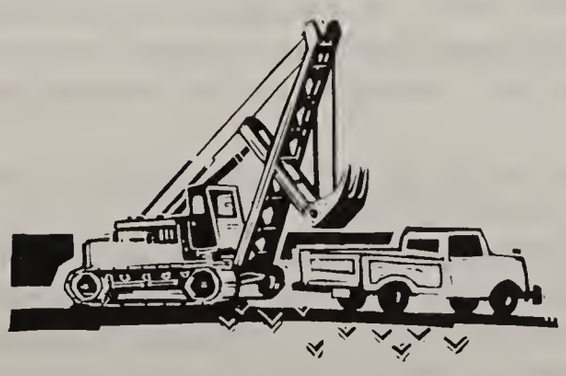
An analysis of the respective perspectives of Black American writers on Africa and African writers on Black America.

31, 131. THE BLACK WOMAN

An examination of the historical role of Black women and an in-depth exploration of contemporary issues germane to Black women in America.

33, 133. BLACK PERFORMING THEATRE

An introduction to and development of basic performance principles and techniques through empathic portrayal of relevant Black material.



MILITARY SCIENCE

John W. Chism, *Colonel, Professor of Military Science*

The University maintains a Senior Division unit of the Army Reserve Officers' Training Corps. The course offered consists of a two-year basic and a two-year advanced curriculum. The program is specifically designed to give college men and women "on-campus" training and experience in the art of organizing, motivating, and leading others. It includes instruction to develop self-discipline, physical stamina, and bearing—qualities that are an important part of leadership and that contribute to success in any kind of career.

Through this voluntary program, the University offers each eligible man and woman the opportunity to obtain an officer's commission while earning his or her college degree. By combining regular academic pursuits with a course of military instruction, the ROTC graduate is well equipped to assume roles of leadership and command responsibility as an officer in the U.S. Army. Uniforms and textbooks are furnished by the Government without cost to the student.

Basic Course

The Basic Course normally is taken by the college student during the freshman and sophomore years.

The instruction in the freshman year is known as Military Science I and in the sophomore year as Military Science II. The purpose of this instruction is to introduce the student to basic military subjects: military history; familiarization with basic weapons, equipment and techniques; military organization and functions; and the techniques of leadership and command. All studies—which require on an average of about three hours per week—are conducted "on campus." It is from the individuals who successfully complete this instruction that the best qualified are selected for the Advanced Course which leads to an officer's commission.

Advanced Course

The college student who wishes to take the Advanced Course, which normally is given in the junior and senior years of college, must apply for it. Only young men and women who have demonstrated a positive potential for becoming effective officers are selected. Most of the individuals who qualify for this training have completed the Basic Course. Student veterans, however, who have had one or more years of active military service and students who have had the equivalent of Military Science I and II in a military school may be granted credit for the Basic Course and be selected for the Advanced Course. Also, under the Two-Year Program, carefully selected college and junior college sophomores who complete special summer training may qualify for enrollment in this course.

The Advanced Course studies in the junior year are known as Military Science III and in the senior year as Military Science IV.

The six week Advanced Course summer camp normally is held between the junior and senior years but, depending upon circumstances which may vary, it could be scheduled after the senior year or possibly between the sophomore and junior years.

Instruction in the Advanced Course includes leadership and the exercise of command, military teaching methods, tactics, logistics, administration and military justice.

Practical leadership and command experience is provided by assigning Advanced Course students as cadet officers and non-commissioned officers.

In addition to the textbooks and uniforms which are provided without cost, the student receives $100 per month during the school year and $283.05 per month for the summer camp period. He also receives six cents per mile for travel to and from the summer camp.

ROTC Deferment

Each male student who signs the ROTC Deferment Agreement receives a draft classification of 1-D which defers him from call to active duty while he is a student in good standing at the University and until he receives both his baccalaureate degree and his reserve commission as a Second Lieutenant. This deferment is cancelled immediately upon discharge from the ROTC program.

Army ROTC Scholarship Program

The Army ROTC scholarship program is designed to offer financial assistance to outstanding young men and women in the four-year Army ROTC program.

Each scholarship provides free tuition, textbooks and laboratory fees in addition to a subsistence allowance of $100 per month for the period the scholarship is in effect. During a six-week summer training period at the end of the junior year, this pay is increased to $283.05 per month. The scholarships are provided under provisions of Public Law 88-647, The ROTC Vitalization Act of 1964.

Scholarships may be awarded for one, two, three or four years. Four year scholarships are open to all students entering Army ROTC as freshmen, while the other scholarships are available to those students who have successfully completed one, two or three years of ROTC studies.

The scholarship recipient is expected to maintain acceptable standards of academic achievement and personal conduct. Scholarship students must rank in the upper third of their Army ROTC class and continuously demonstrate leadership potential. The records of scholarship recipients will be reviewed each quarter by the Professor of Military Science to determine the student's eligibility for continued financial assistance.

Students who fail to maintain the desired standards may lose their Army ROTC scholarship.

Recipients of Army ROTC scholarships are required to serve six years in the Army, at least four years of which must be on active duty unless released earlier by the Secretary of the Army. Any of the six year period remaining after release from active duty must be spent in a reserve status.

Detailed information on the scholarship program may be obtained from the office of the Professor of Military Science at the University.

Two-Year ROTC Program

The Department of the Army offers students who enter the University with advanced academic standing the opportunity to receive a commission after two years of on-campus ROTC training. A student can take advantage of this opportunity by attending a basic summer camp after his sophomore year and then completing the Advanced Course, ROTC, in his junior and senior years. The basic summer camp prior

to enrollment in the Advanced Course substitutes for the first two years of the normal four-year program. Except for this substitution, the two programs are identical.

A student accepted into this program or the advanced course obligates himself to accept a commission, if offered, and to serve on active duty for a period of two years, followed by four years in a Reserve Component. Prerequisites for enrollment in this program are as follows:

a. Be physically fit and mentally qualified.
b. Be of sound character.
c. Be at least 17 years old. A student must not be more than 28 years old when commissioned.
d. Be recommended by a board of officers.
e. Have successfully completed the basic summer camp training in lieu of the basic Military Science curriculum.

The Army ROTC Flight Instruction Program

The Army ROTC Flight Instruction Program is offered to students in the second year of the Advanced Course, usually the senior year of college.

Under this program, the Army will pay for flight training for selected ROTC students who have an aptitude for flying and who meet required qualifications.

The student receives a basic introduction to the principles of flying in small, fixed-wing aircraft. He learns the principles of navigation, map and compass reading, take-offs and landings, and will accrue many hours of solo flying. ROTC flight instruction is given by a civilian flying school, near the college, which has the approval of the Federal Aviation Agency (FAA), the Department of the Army, and the college.

The program is conducted as an extracurricular activity. Instruction is normally completed in four months, but up to nine months is allowed in special cases. Each student receives 35 hours of ground instruction and 36½ hours of instruction in-flight. Three additional hours of instruction may be authorized to meet individual needs. Little additional work is required to qualify for a private pilot's license.

Commissioning in the United States Army Reserve and Regular Army

Students who complete the Advanced Course are eligible for appointment and commission by the President of the United States as officers in the United States Army Reserve. Reserve commissions are tendered in all branches of the Army, except the Medical, Dental, Veterinary, Judge Advocate, and Chaplain Corps. The branch in which a student is commissioned is determined by his preference, leadership potential, academic background, recommendations of the faculty and staff, and needs of the service. A newly commissioned officer will normally attend his branch school upon being ordered to active duty. Current laws and regulations require each Advanced Course student, upon receipt of his commission, to complete a two-year tour of active duty and to serve in a reserve component for a subsequent period of four years. Delays in reporting to active duty may be granted to students if they desire to obtain an advanced degree. A student may be delayed from call to active duty for a period not to exceed four years, provided he is enrolled in a full-time program of instruction leading toward an advanced degree and remains in good academic standing with the institution in which enrolled. No additional obligation is incurred by this delay for graduate training.

A student who receives his baccalaureate degree and has been designated a "Distinguished Military Graduate" by the President of the University and the Professor of Military Science may, upon application, be commissioned directly in the Regular Army.

Basic Courses

10. AMERICAN MILITARY HISTORY

Term course. Four class hours and one drill period per week. Fall and winter terms.

12. UNITED STATES DEFENSE ESTABLISHMENT

Sustaining course. Two class hours and one drill period per week. Fall and winter terms.

13. COMMUNICATIONS SYSTEMS

Sustaining course. One class hour and one drill period per week. Spring term.

21. ADVANCED MAP READING AND AERIAL PHOTOGRAPHY

Sustaining course. Two class hours and one drill period per week. Fall term.

22. EVOLUTION OF WEAPONS

Sustaining course. One class hour and one drill period per week. Spring term.

23. SMALL UNIT TACTICS AND COMMUNICATIONS I

Sustaining course. Two class hours and one drill period per week. Winter term.

Advanced Courses

111. MILITARY LEADERSHIP THEORY

Sustaining course. Two class hours and one drill period per week.

112. MILITARY TEACHING METHODS

Sustaining course. Two class hours and one drill period per week.

113. SMALL UNIT TACTICS AND COMMUNICATIONS II

Sustaining course. Two class hours and one drill period per week.

121. MILITARY MANAGEMENT: COMMAND AND STAFF FUNCTIONS

Sustaining course. Two class hours and one drill period per week.

122. CONVENTIONAL AND COUNTERINSURGENCY MILITARY OPERATIONS

Sustaining course Two class hours and one drill period per week.

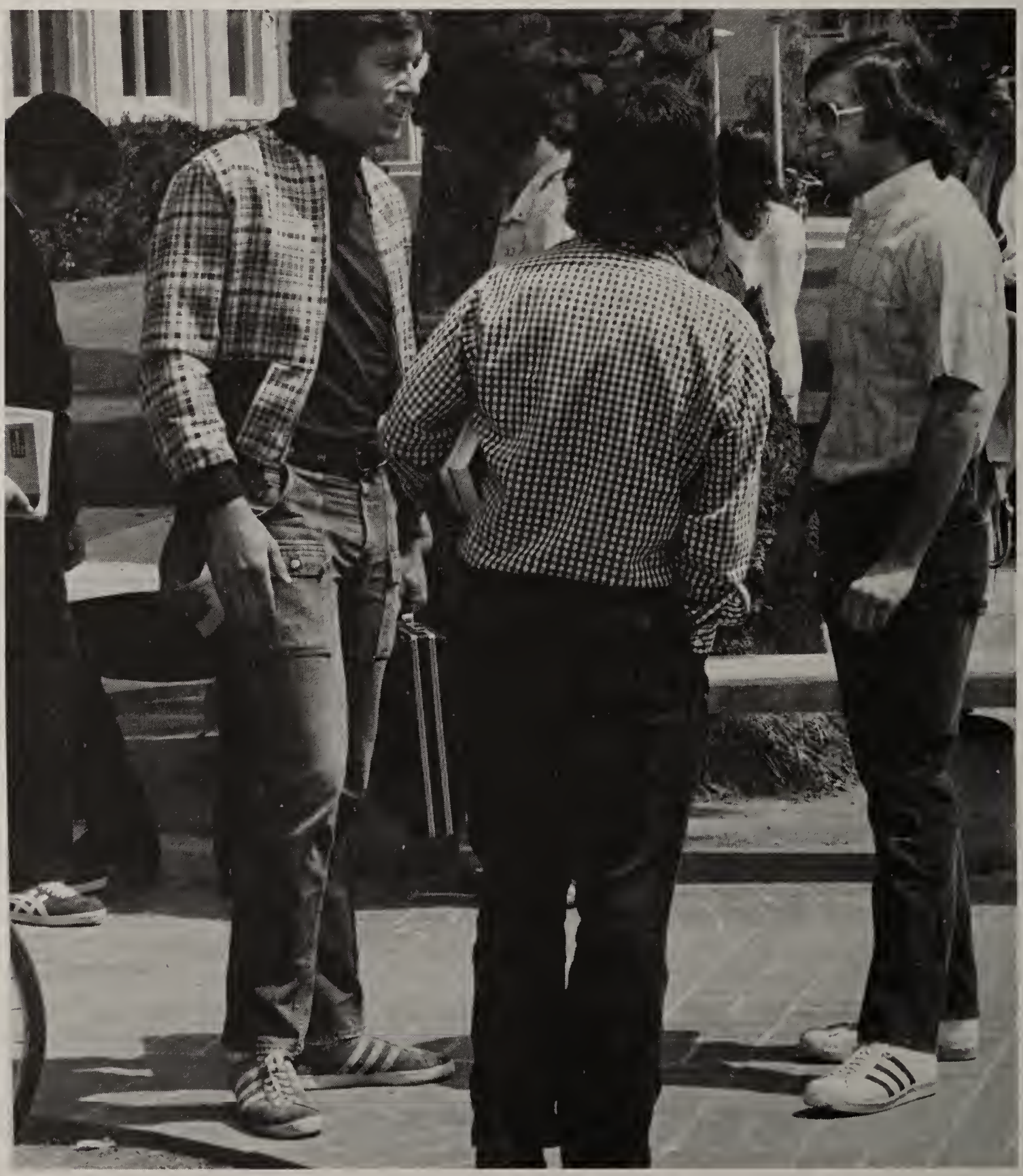
123. IMPLICATIONS OF WORLD CHANGE AND MILITARY LAW

Term course. Four class hours and one drill per week.

Academic Credit

Students enrolled in the military science department are permitted to take two (2) term courses that are credited towards completion of requirements for a bachelor's degree: 10 American Military History (which also meets a university history requirement) and 123 Implications of World Change and Military Law. In addition, grade-point-average credit is granted for two (2) sustaining courses: 13 and 23.

Satisfactory completion of all Military Science courses is a requirement for commissioning.



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William B. Perkins, S.J. 1971–1977
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Saratoga, California

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San Jose, California

Robert T. Greene (1973)
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Michael Guerra (1974)
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San Jose, California

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Los Angeles, California

Merle R. Jones (1975)
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Carson City, Nevada

Edward A. Lewis (1975)
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Hillsborough, California

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Indian Wells, California

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BSC '38, 1966-68

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Professor of Physics; Academic Vice President
A.B., 1952, M.A., 1953, St. Louis University; Ph.D., 1958, Harvard University.

GERALD L. ALEXANDERSON (1958)
Professor of Mathematics; Chairman, Department of Mathematics
B.A., 1955, University of Oregon; M.S., 1958, Stanford University.

LOUIS I. BANNAN, S.J. (1953)
Associate Professor of Education
B.A., 1937, M.A., 1938, Gonzaga University; S.T.L., 1944, Alma College.

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Professor of Physics; Chairman, Department of Physics
B.A., 1941, Yale University; M.A., 1948, California Institute of Technology; Ph.D., 1952, St. Louis University.

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Professor of Economics and Business Administration; Chairman, Department of Economics
B.A., 1954, A.M., 1955, Midwestern University; Ph.D., 1960, University of Texas.

MAURICE M. BELVAL, S.J. (1965)
Assistant Professor of Modern Languages
B.A., 1938, Loyola University of Los Angeles; M.A., 1944, Gonzaga University; *Doctorat d'Universite*, 1965, University of Paris (Sorbonne).

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Professorial Lecturer in English
B.A., 1931, Webster College; M.A., 1933, Ph.D., 1943, St. Louis University.

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Associate Professor of Modern Languages
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Acting Assistant Professor of Philosophy
B.A., 1964, University of Akron; M.A., 1967, State University of New York, Buffalo.

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B.A., 1965, Pomona College; M.S., 1966, Ph.D., 1971, Stanford University.

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Professor of Electrical Engineering; Chairman, Department of Electrical Engineering
B.S., 1955, Virginia Military Institute; M.S., 1957, Ph.D., 1963, University of Illinois.

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Assistant Professor Electrical Engineering
B.S., 1965, Oakland University; M.S., 1967, Ph.D., 1970, Stanford University.

RAYMOND F. COPELAND, S.J. (1959)
Professor of Speech and Religious Studies (Emeritus)
A.B., A.M., 1927, Gonzaga University; S.T.L., 1935, Alma College; Ph.D., 1950, St. Louis University.

FRANCIS J. CORRIGAN (1967)
Professor of Business Administration
B.S.C., Saint Louis University; M.B.A., Stanford University; Ph.D., Saint Louis University.

RICHARD T. COZ, S.J. (1963)
Assistant Professor of Economics
A.B., 1953, M.A., 1954, Gonzaga University.

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Professor of Mathematics
Nat. Phil. Cand., 1948, Math. et Phys. Drs., 1953, Dr. Math. et Phys. Sc., 1959, University of Amsterdam, The Netherlands.

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Acting Assistant Professor of Sociology
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B.A., 1965, University of Santa Clara.

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B.A., 1966, Fresno State College; M.A., 1969, Ph.D., 1971, Claremont Graduate School.

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Professor of Physics
B.E.E., 1953, University of Santa Clara; M.S., 1954, Ph.D., 1959, Stanford University.

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Assistant Professor of Religious Studies
A.B., 1964, Gonzaga University; M.A., 1966, Marquette University; Ph.D., 1972, Vanderbilt University.

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Professor of English
A.B., 1948, University of Notre Dame; M.A., 1950, Ph.D., 1960, University of Pennsylvania.

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Assistant Professor of Religious Studies
M.A., 1952, Gonzaga University; S.T.L., 1960, University of Innsbruck; S.T.D., 1970, The Pontifical Gregorian University.

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Assistant Professor of Electrical Engineering
A.B., 1958, University of California, Berkeley; M.S.E.E., 1968, Ph.D., 1970, University of Santa Clara.

KENNETH D. EBERHARD (1971)
Assistant Professor of Religious Studies
B.A., 1960, Conception College; M.A., 1965, University of San Francisco; Th.D., 1970, Graduate Theological Union, Berkeley.

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Director of Ethnic Studies
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Visiting Assistant Professor of Biology
B.A., 1965, Hiram College; M.S., 1967, Purdue University; Ph.D., 1971, University of Miami.

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B.A., Bishops University; M.B.A., D.C.S., Harvard University.

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Professor of Philosophy
A.B., 1923, A.M., 1924, Gonzaga University; S.T.L., 1932, Weston College; Ph.D., 1949, The Pontifical Gregorian University.

TIMOTHY FALLON, S.J. (1965)
Assistant Professor of Philosophy; Chairman, Department of Philosophy
A.B., 1946, M.A., 1947, Gonzaga University; S.T.L., 1953, Alma College; Ph.D., 1967, University of Toronto.

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Associate Professor of Biology
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B.A., 1949, M.A., 1950, Gonzaga University; S.T.L., 1957, Alma College; M.S., 1961, Ph.D., 1965, Saint Louis University.

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Associate Professor of Mechanical Engineering
B.M.E., 1950, University of Santa Clara; M.S., 1965, Stanford University; Registered Professional Engineer.

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A.B., 1936, M.A., 1938, University of Utah; Ph.D., 1956, Stanford University.

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Associate Professor of History
A.B., 1958, Seattle University; Ph.D., 1967, University of Washington.

GEOFFREY FOX (1969)
Assistant Professor of Physics
B.S., 1962, University of Santa Clara; Ph.D., 1967, University of Wisconsin.

GRANT A. FRASER (1972)
Assistant Professor of Mathematics
A.B., 1964, M.A., 1969, Ph.D., 1970, University of California, Los Angeles.

MARCIA M. FREDERICK (1967)
Assistant Professor of Speech and Theatre Arts
A.B., 1965, M.A., 1967, California State College, Long Beach.

JAMES A. FULTON (1969)
Assistant Professor of Education
B.S., 1962, M.S., 1965, Ph.D., 1969, Southern Illinois University.

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Assistant Professor of History
B.S., 1965, Cornell University; M.S., 1967, Ph.D., 1972, University of Wisconsin.

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Lecturer in Religious Studies
B.A., 1956, M.A., 1957, Gonzaga University; S.T.D., 1970, St. Albert's College, Louvain.

GEORGE F. GIACOMINI, JR. (1962)
Lecturer in History
B.A., 1956, University of Santa Clara; M.A., 1957, University of California, Berkeley.

ALBERT L. GIBSON (1969)
Lecturer in Speech and Theatre Arts; Theatre Manager
B.A., 1965, Stanford University.

WENDELL J. GOESLING (1969)
Assistant Professor of Psychology
B.A., 1965, Fresno State College; Ph.D., 1969, University of Tennessee.

MILTON A. GONSALVES, S.J. (1972)
Acting Assistant Professor of Philosophy
B.S., 1950, University of San Francisco; M.A., 1957, St. Louis University.

JOSEPH A. GRASSI (1971)
Associate Professor of Religious Studies; Acting Chairman, Department of Religious Studies
B.A., 1943, Maryknoll College; S.T.L., 1949, Angelicum; S.S.L., 1951, Pontifical Biblical Institute.

JOHN H. GRAY, S.J. (1961)
Associate Professor of English; Dean, College of Humanities
A.B., 1948, Gonzaga University; A.M., 1952, Loyola University, Los Angeles; S.T.L., 1956, St. Albert's College, Louvain; Ph.D., 1961, University of London.

EDWARD D. GROSS (1964)
Assistant Professor of English
A.B., 1947, M.A., 1951, Ph.D., 1964, University of Pennsylvania.

RAMSDELL GURNEY (1968)
Assistant Professor of History
B.A., 1956, Williams College; M.A., 1961, Ph.D., 1968, State University of New York, Buffalo.

AFARI-GYAN (1972)
Acting Assistant Professor of Ethnic Studies
B.A., 1967, M.A., 1969, University of Ghana.

HENRY V. HAHNE (1959)
Professor of Civil Engineering; Chairman, Department of Civil Engineering
Dipl. Ing., 1949, Technische Hochschule; Ph.D., 1954, Stanford University.

JAMES L. HALL (1971)
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UNDERGRADUATE CATALOG

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